PACKAGE engineering

Savings with end-opening cases

Tests show end-opening corrugated cases use up to 30 per cent less board than top-opening cases. They also take just as much rough handling—Page 51

Tiny samples run on mobile line

Intermittent packaging of miniature samples need not impede normal production. Have a portable line to set up just when you need it, run them there—Page 58

Odor detection: no easy job

Knowing how to find odor sources and cut down their effects goes far in solving odor problems. Tests that measure odor contamination help you, too—Page 70

New products, literature—Page 96

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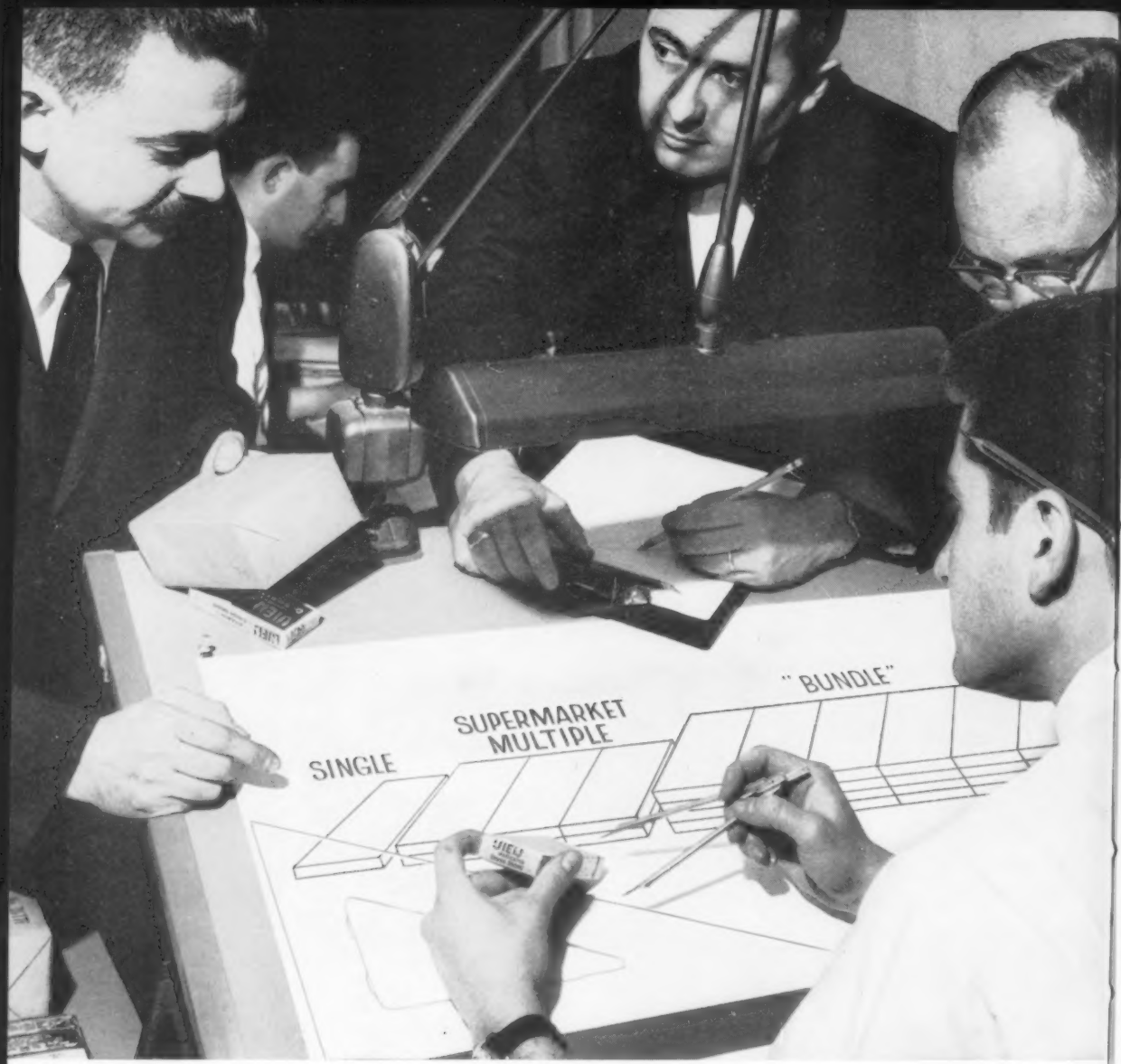
SEPTEMBER 1961

VOLUME 6 • NUMBER 9



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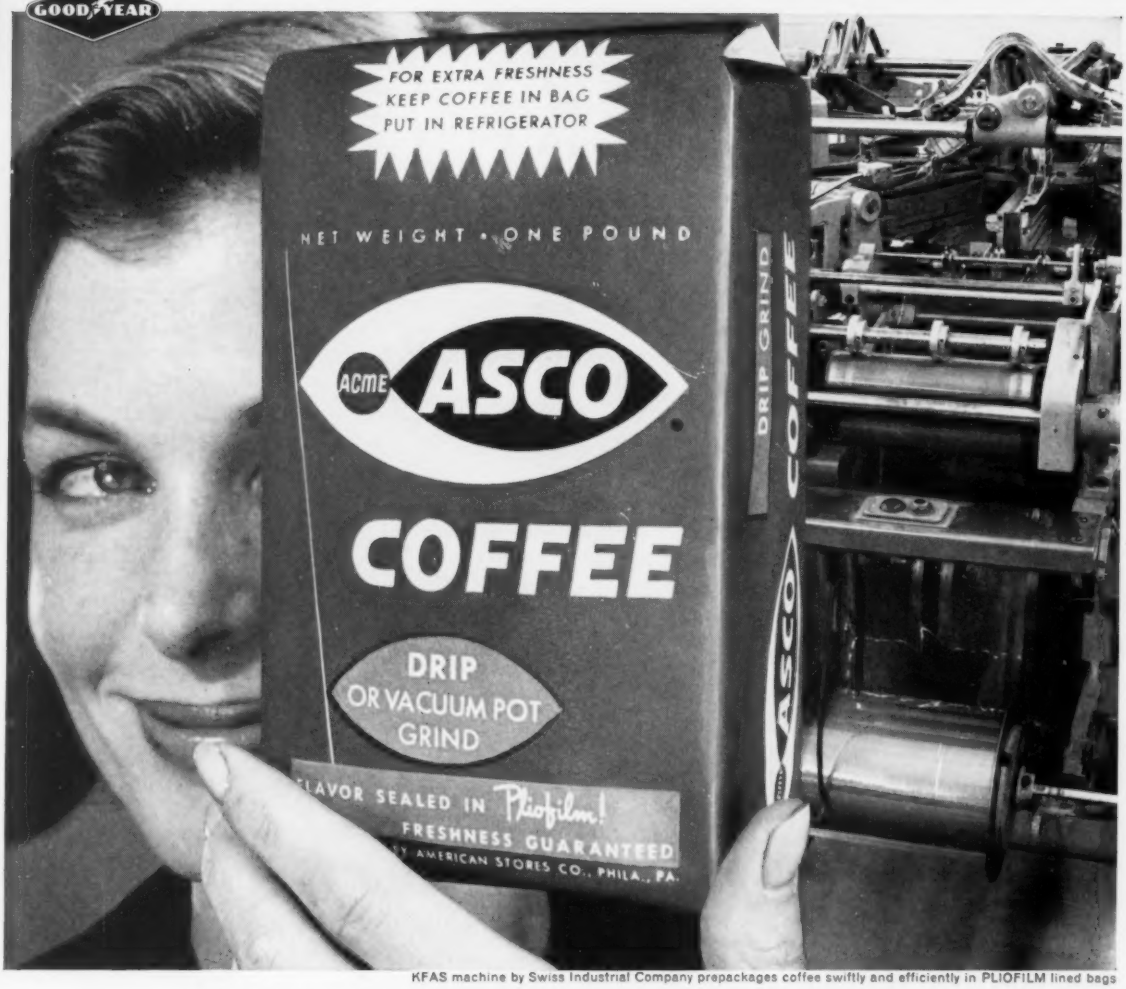
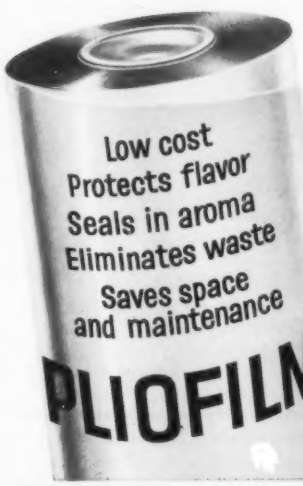


KFAS machine by Swiss Industrial Company prepackages coffee swiftly and efficiently in PLIOFILM lined bags

Thriftiest way to keep coffee fresh



It's the PLIOFILM liner that makes it possible for American Stores, and many others, to pregrind, prepackage their coffee—keep it fresh and sell it at lowest cost.

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PACKAGE engineering

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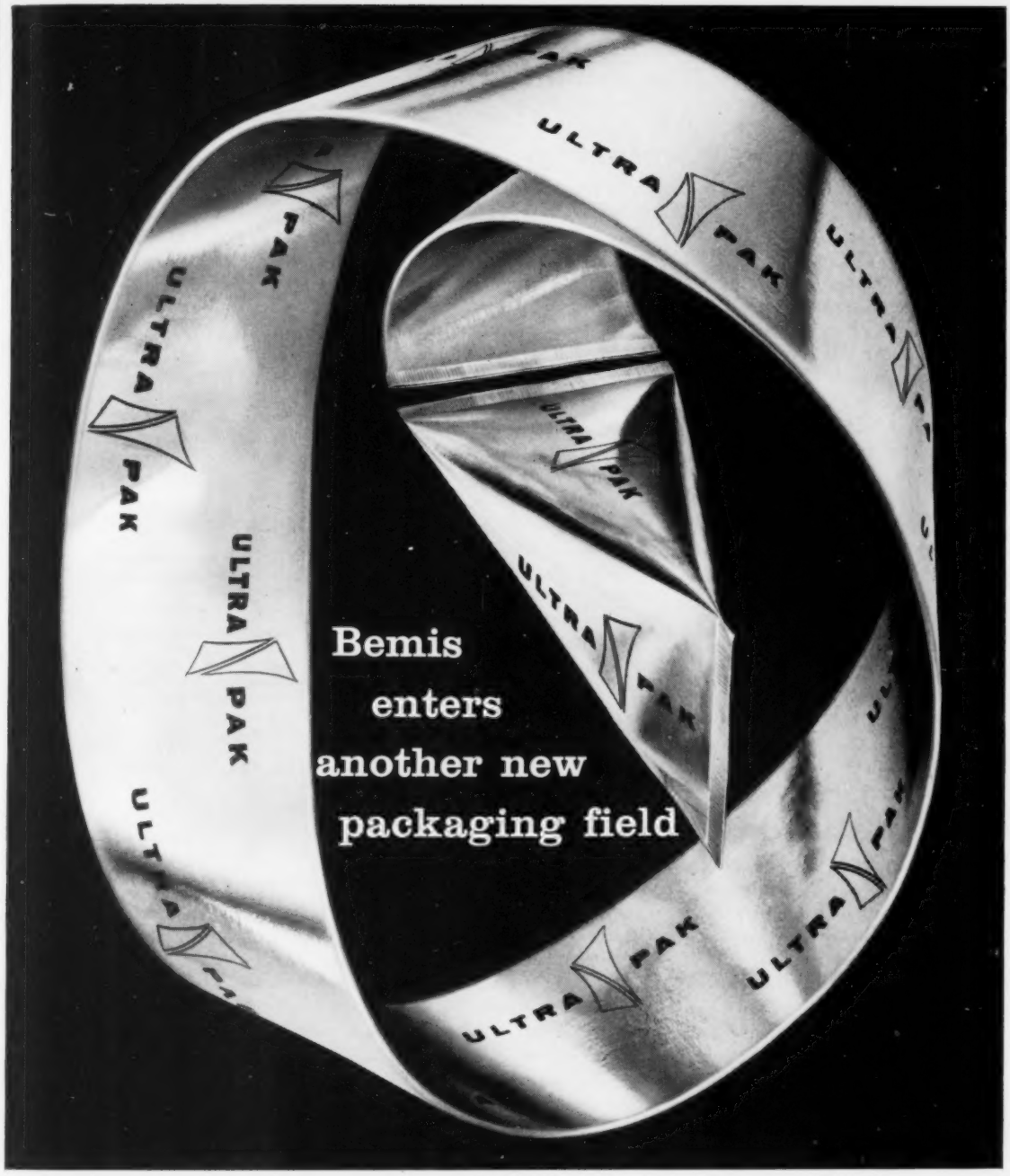
Package Engineering is indexed in Engineering Index



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A note from the Publisher

The government looks at packaging

About a year ago, this column discussed the possibility of packaging becoming a political "whipping boy" because of the deceptive packaging of a very, very small fraction of the hundreds of thousands of packaged products sold at retail. From the hearings held in Washington in June by Senator Hart's subcommittee on packaging and labeling, it appears that the time may be now.

Three general aspects of packaging are being criticized. First, slack fill—both excessive interior packaging and excessive air space; second, packaging to a price—reducing contents and not price; and third, certain labeling practices involving the use of adjectives such as "jumbo" or "king size" to imply that a unit of measure is larger than it actually is.

These first hearings were largely devoted to critics of packaging, but presumably the packaging industry will present its side of the story at later hearings which, at this time, have not been set.

One very obvious fact that critics of "packaging-to-price" overlook is that this is a sympton of inflation that cannot be cured by legislating against packaging.

No one in packaging condones deceptive packaging and no businessman who expects his business to grow and prosper would intentionally deceive a buyer.

In any event, as a result of these hearings, it seems highly probable that government restrictions on packaging could result.

Canada has had similar hearings that started in 1959 and finally resulted in legislation effective in 1962. The Canadian legislation empowers the Food and Drug Directorate to act against packages that have the intent to deceive but does not spell out specific rules. This seems a reasonable approach.

The Food and Drug Administration in this country already has the authority to move against deceptive packaging although, to date, only one action it has taken has been upheld in court and it is being appealed. It seems likely that more funds will be provided the FDA so that it can take a more aggressive attitude toward enforcing the present law. While I certainly would defend the right of a manufacturer to change prices and package sizes as he sees fit, there may be a move to a standardization of package sizes, as well as more aggressive action by the FDA.

In view of these two probabilities there is one obvious conclusion. The function of package engineering will become more important. Visual appeal of a package will continue to be important to attract a customer to a specific product, but quality and price will become all important if sizes are standardized. You can control fill and keep your costs down by investing in the best packaging machinery available. You can maintain quality, increase shelf life, and lower costs by constantly reviewing your packages to make sure you are not being obsoleted by this rapidly changing field.

Regardless of the hearings or the results, however, good packaging practice always demands honesty in every area.

Angus J. Ray

Publisher

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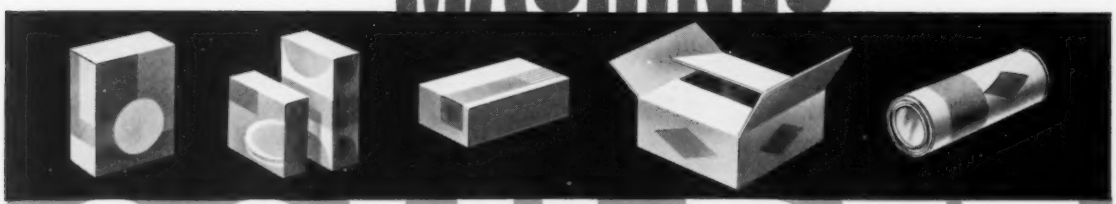

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September 11-13. AMA workshop seminar on packaging costs and controls:
Hotel Astor, New York, N.Y. Contact: John L. Wood, packaging coordinator, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

September 17-22. University of California short course in plant layout, material handling, warehousing and shipping:
Lake Arrowhead Conference Center, Lake Arrowhead, Calif. Contact: Dr. Sam Houston, Department K, University Extension, University of California, Los Angeles 24, Calif. *Telephone: GRanite 3-0971 or BRadshaw 2-6161.*

September 18-23. The University of Kansas 6th Annual Plant Layout and Facilities Planning Course:
Town House Hotel, Kansas City, Kan. Contact: E. S. Avison, assistant manager, The University of Kansas Extension Center, 39th and Rainbow Blvd., Kansas City 12, Kan. *Telephone: KEndall 2-1538 or 2-9387.*

September 26-27. American Society for Testing Materials Committee F-2 on flexible materials semiannual meeting:
Quartermaster Research & Engineering Command, Natick, Mass. Contact: R. H. Giljohann, committee secretary, Pet Milk Co., Greenville, Ill. *Telephone: 1555.*

October 1-4. Produce Packaging Association 11th Annual Convention and Exposition:
Chase—Park Plaza Hotel, St. Louis, Mo. Contact: Robert L. Carey, executive secretary, Produce Packaging Association, P.O. Box 29, Newark, Del. *Telephone: ENdicott 8-2906.*

October 4-6. AMA orientation seminar on plastic containers:
Hotel Astor, New York, N.Y. Contact: John L. Wood, packaging coordinator, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

October 10-12. Department of Defense (Director of Defense Research and Engineering) 30th Symposium on Shock, Vibration and Associated Environments:
Statler Hilton Hotel, Detroit, Mich. Contact: Code 4021, U.S. Naval Research Laboratory, Washington 25, D.C. *Telephone: JOhnson 3-6600, Ext. 2220.*

October 18-20. Packaging Institute 23rd Annual National Packaging Forum:
Biltmore Hotel, New York, N.Y. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Ave., New York 17, N.Y. *Telephone: MUrray Hill 7-8875.*

November 7-10. Packaging Machinery Manufacturers Institute Show of 1961:
Cobo Hall, Detroit, Mich. Contact: W. L. Redding, Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22, Pa. *Telephone: ATlantic 1-8552.*

November 8-9. PMMI Preventive Maintenance Conference-Workshop:
Cobo Hall, Detroit, Mich. Contact: Richard Wellbrock, New Jersey Machine Corp., 1600 Willow Ave., Hoboken, N.J. *Telephone: OLdfield 9-0483.*

November 13-14. Society of Packaging & Handling Engineers 1961 National Packaging and Materials Handling Competition, and 7th Annual Eastern Packaging and Handling Show:
Fifth Regiment Armory Hall, Baltimore, Md. Contact: C. Telfair Leinbach, Jr., 3120 St. Paul St., Baltimore 18, Md. *Telephone: HOpkins 7-6363.*

January 21-24, 1962. Canning Machinery and Supplies Association 54th Annual Exhibit:
Americana Hotel, Bal Harbour, Miami Beach, Fla. Contact: W. D. Lewis, secretary-treasurer, Canning Machinery and Supplies Association, 4630 Montgomery Ave., Washington 14, D.C. *Telephone: OLiver 6-6979.*

January 22-24, 1962. National Canners Association 54th Annual Convention:
Americana Hotel, Bal Harbour, Miami Beach, Fla. Contact: R. F. Alexander, National Canners Association, 1133 20th St., N.W., Washington 6, D.C. *Telephone: FEderal 8-2030.* *(End)*

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JOHNSON & JOHNSON — New Brunswick, N. J., sell "Castaway", disposable razors for hospitals and other institutions in Thilco Print-Decorated POLY-KRAFT Bags. Heat-sealed bags also protect against corrosive elements in all climates.

LEAF BRANDS, INC. — Chicago, package Rain-Blo Ball Bubble Gum in POLY-KRAFT Carton Liner Bags to preserve freshness and flavor in transit and storage; prevent sticking, blocking and loss of sheen from m.v.t. penetration.

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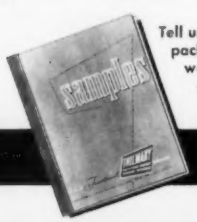

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The PULSE of packaging

Trends to watch:

Florida's citrus industry is moving into more packaging than just the canning of juice concentrates. CONTINENTAL BEVERAGES INC. has a new plant at Eloise, Fla. packaging three different mixed drinks in 6-oz. cans.

Noting that the alcohol for the drinks is a by-product of citrus, company officials predict a $1 million a year outlet for Florida citrus through the new operation. Meanwhile other uses for citrus pulp (such as for cattle feed) make more packaging news.

Producers of extensible paper say more companies in the citrus field are switching from burlap to multiwall bags of extensible papers. Reports indicate this industry now uses 6 million 100-lb. bags per year and expects to use 7 million by 1965.

A survey of pharmaceutical manufacturers discloses general approval of aerosol packages for topical applications but much disagreement about aerosols for systemic or body orifice applications. These findings show up in a PACKAGING INSTITUTE advisory service report (No. 351), which notes that in spite of the advantages cited for aerosol packages, opinion is split almost in half on whether aerosol packaging is economical "considering all figures."

From elsewhere in the pharmaceutical field we hear of growing interest in the application of plastic bottles. Companies which have not made any changes from glass to plastic see a long range trend to plastic as a means of cutting costs.

Pharmaceutical packagers also note the growing cost of meeting government regulations. At least one company notes that the cost of testing and evaluating packaging materials to be sure of compliance with regulations has hiked the cost of operation at least 8 per cent.

Another current problem bothering pharmaceutical packagers is furnishing label information where the label is not large enough to hold it. This means putting a flyer in each bottle after cottoning—taking as many as five extra people on a line to get the job done.

Current trends in food packaging include frozen strawberries in square transparent containers, cheese dips in round translucent containers, jams and jellies in round transparent containers, and pecans in square colored containers, according to PLASTIC FOOD CONTAINER ASSOCIATION.

Noting that some of these are already in supermarkets across the country, the association says others will be there within the next few months.

It attributes the rise in plastic usage to improvements in materials, weight advantages, research and development by suppliers, tougher and less expensive materials, new forming techniques, and innovations in packaging line machinery to handle these containers.

Noting with approval the enthusiasm of major meat packers about its new ham container with a scored tear strip, AMERICAN CAN CO. says this innovation will boost sales of canned ham 10 to 15 per cent. The new container with its tear strip that rolls the can edges in the opening process took 18 months to develop. It should start showing up in stores early next year.

A trend to more use of cans for soft drinks also put Canco in the news recently. It is setting up a network of high-speed canning plants to package soft drinks in cans for beverage manufacturers. Initial plans are to put such plants in Baltimore, Cincinnati, Jacksonville, Fla., New Orleans, St. Louis, and in the Winston-Salem-Greensboro area, N.C.

Paper and glass container manufacturers look to price relief as the route to higher profits, according to the VALUE LINE INVESTMENT SURVEY. Although it notes that glass container companies posted a price increase several months ago, it predicts that paper container makers probably will have to wait until next year before the supply and demand pattern is sufficiently favorable to permit price increases. The survey reports that as of late July weak prices still prevail through this part of the container industry.

Packaging across the seas:

During the last 10 years Sweden's consumption of paper and board has risen 152 per cent in value. Similar rises for tin cans and glass containers are 98 and 63 per cent respectively.

The economists who report this in the first Swedish scientific work on packaging, "The Economy of Consumer Packaging," predict a 50 per cent increase in frozen food packaging between 1960 and 1965. The number of self-service stores in Sweden has jumped from 120 in 1950 to 5,700 today, they note.

A four-day convention on packaging consumer products for export will take place in London, Sep-

SEALED CARTON
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Krug's cuts cost 40% ...doubles packaging production with end loading CECO® cartoners

PACKAGING PRODUCTION DOUBLED—Krug's, one of New York's leading bakeries, reports that they have increased their packaging production by 100% while at the same time reducing their labor costs by 40%. For example, as shown in the photos above, with one girl loading and another unloading, they package 32 delicate cakes a minute. With a changeover that takes but a few minutes to make, the same loading operator could load 70 pies a minute. That's production!

30% CARTON SAVINGS—Along with the increase in production, the switch to end-loading CECO Model 40 Cartoners has enabled Krug's to use folding cartons at a saving of 30% in carton costs, and additional savings in warehousing costs. These savings alone pay for the CECO Cartoners in a short time.

EXTRA VALUE TOO—This change to folding cartons has given Krug's products an extra plus too, because unlike old-style two-piece cartons, their one-piece cartons are sealed—sealing in the freshness that the consumer appreciates.

The list of bakeries using the CECO Model 40 Cartoner is long, including Wagner, Drake, Fischer, Dugan, Blue Bird, Bradley Pie, Table Talk, Horn & Hardart, and many others. Find out how you can slash production costs. Write for brochure today.

CONTAINER EQUIPMENT CORPORATION

MEMBER, PACKAGING MACHINERY MANUFACTURERS INSTITUTE

78-88 LOCUST AVENUE, BLOOMFIELD, N. J.

from ALCOA September, 1961

Current Closure Report

A new closure for the packaging of foods in widemouthed jars. The Flavor-Lok® RO (Roll-On) Closure combines the convenience of easy-to-remove, easy-to-reseal threaded closures with the extra-high sealing qualities of aluminum closures applied by the Roll-On process.

The Flavor-Lok Closure is a two-piece construction, a lined inner disc and an outer band which is custom-threaded to the glass finish. During removal, the band rotates easily and makes a slight turn before the disc is engaged and lifted to break the vacuum.

Specifications — Two-piece Flavor-Lok RO

Currently available in the 48-mm and 53-mm sizes which are being used with success in the baby food field. Lining materials are developed to your needs or specifications. Glass finish required is Alcoa S-1343. Lithographic treatments are created in colors and designs of your choice.

A new closure for the packaging of foods in narrow-mouthed bottles. This Flavor-Lok Closure, featuring highly economical protection, is designed to meet the extreme sealing demands of such high-spoilage items as ketchup and chili sauce, which are very acidic, easily discolored by air and yet must have a long shelf life. Such products require a closure that will retain a vacuum and keep the product fresh for two years or longer.

Acid-resistant and corrosion-resistant aluminum closures are friendly to food. Because this Flavor-Lok Closure is top- and side-sealed and tailor-capped to each individual bottle, it keeps out air and foreign matter, and prevents mold growth indefinitely.

Specifications — Single-piece Flavor-Lok RO

Available in 28-mm, 31-mm and 38-mm sizes. Glass finishes require: standard length — Alcoa S-1371 (standard single thread); short flange — Alcoa S-1426 (28-mm standard single thread) or Alcoa S-1422 (31-mm standard single thread). Lithography to your order.

RO (Roll-On) Application. Alcoa® Aluminum RO Closures are furnished with straight-sided skirts. The closure is placed on the container . . . the sealing head of the machine exerts a controlled uniform downward pressure embedding the glass sealing surface into the facing material and creating a positive seal . . . rollers in the head of the sealing machine then form the skirt of the closure against the container following the path of the container threads. Each closure is custom-threaded . . . a perfect fit every time. And . . . liner facings are never damaged . . . removal torques are more constant . . . eliminates "cocked" caps . . . RO Closures will not loosen and leak . . . liners will not stick to the glass.

Equipment and Service. Alcoa sealing machines for applying Flavor-Lok Closures range from the AA model, semiautomatic, single-head, to the VC-RB high-speed rotary model for vacuum-packed products.

Each piece of equipment is custom-built and delivered to handle one size of container and closure, but it is also designed to allow fast, easy installation of change-over parts.

A full staff of technicians is maintained by Alcoa to provide installation service, in-plant assistance and operator training.

Over-all capping operations with aluminum are economical. Application is fast, closely controlled. Greater sealing efficiency is assured.

Write for Alcoa's Closure Brochure.

*Registered Trademarks of Aluminum Company of America

Your Complete Packaging Service Center

to ALCOA

I want an Alcoa representative to contact me with regard to

- ☐ **Foil Packaging**
- ☐ **Aluminum Closures**
- ☐ **Cans and Containers**

☐ Foods	☐ Chemical and Household Products
☐ Frozen Foods	☐ Dairy Products
☐ Meats	☐ Beer
☐ Fish	☐ Industrial Parts
☐ Pet Food	☐ Instant Beverages
☐ Pharmaceuticals	☐ Tobacco Products
☐ Drugs	☐ Petroleum Products
☐ Cosmetics	☐ Condiments
☐ Toiletries	☐ Seeds
☐ Wine	☐ Others
☐ Liquor	

(Fill in specific applications)

_____

_____

_____

ALCOA ALUMINUM

BETTER PACKAGING

Aluminum Company of America
1737-J Alcoa Building, Pittsburgh 19, Pa.

Name_____

Company_____

Address_____

City_____ __Zone State____

tember 6-7 and 13-14—during the INTERNATIONAL PACKAGING EXHIBITION. Speakers will discuss foods and beverages; pharmaceuticals, fine chemicals and cosmetics; textiles and clothing; household goods and domestic appliances.

The 7th SYMPOSIUM ON FOOD ADDITIVES will be held in Belgrade, Yugoslavia, October 11-17, 1961. The European Packaging Federation is one of the sponsors.

The agenda covers glassware, metal packaging, paperboard and related materials, plastics, coatings for food products, pressurized packages, conditioning of fruits and vegetables.

(Because of government regulations as a factor limiting foreign trade and food products, our State Department anticipates having the United States government represented there.)

GENERAL FOODS CORP. recently acquired three companies in Europe and one in Australia. These include Sulta S.A., pepper and spice maker, Bray-Sur-Seine, Paris; Krema Hollywood Co., Paris candy and gum manufacturer; Bertagni, S.p.A., Bologna, Italy maker of pasta and spaghetti; and Parsons Foods Pty. Ltd., diversified Australian food processor.

GF will keep on producing what these companies make and expand their operations by adding American products to their lines.

UNION CARBIDE EUROPA recently opened its technical service laboratory in Versoiz (Geneva), Switzerland. It has production and testing equipment to work with polyethylene, polystyrene, polyvinyl chloride, and copolymers. Among other activities, it will do feasibility studies for new packaging materials and applications.

Groups in the news:

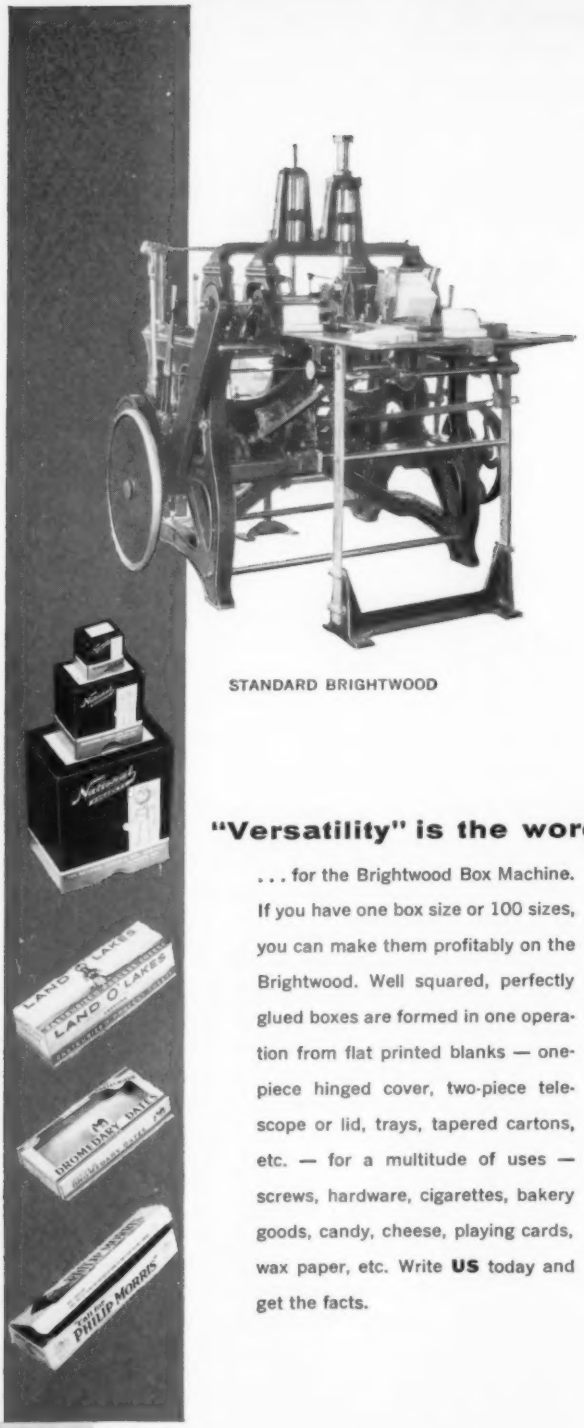
The PACKAGING INSTITUTE reports three publications available: a checklist for carded packaging, $0.25; a 41-page adhesion to board manual, $5; special report 61-1, bulge and compression testing, $1. Readers wanting them should write: Packaging Institute, 342 Madison Ave., New York 17, N.Y.

AMERICAN SOCIETY FOR TESTING MATERIALS *Committee F-2 on flexible barrier materials has formed a section to promulgate standards for cellulosic films primarily for packaging use. Organization of the new section will take place at the semiannual meeting of F-2 at the Quartermaster Research and Engineering Command, Natick, Mass., September 26-27.*

ASTM Committee D-10 on packaging plans an exploratory meeting on the development of standard physical test methods applicable to consumer size packages of all kinds. The committee will take this up at its semiannual meeting in Ottawa, Ont., October 4.

Notes from the government:

James V. Richards, Bemis Bro. Bag Co., Brooklyn, N.Y., received the certificate of service of the U.S.



"Versatility" is the word

. . . for the Brightwood Box Machine. If you have one box size or 100 sizes, you can make them profitably on the Brightwood. Well squared, perfectly glued boxes are formed in one operation from flat printed blanks — one-piece hinged cover, two-piece telescope or lid, trays, tapered cartons, etc. — for a multitude of uses — screws, hardware, cigarettes, bakery goods, candy, cheese, playing cards, wax paper, etc. Write **US** today and get the facts.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE PMMI MEMBER

U. S. AUTOMATIC BOX MACHINERY CO., INC.

98 ARBORETUM ROAD, ROSLINDALE, BOSTON 31, MASS.

Branch Offices: New York • Chicago • Springfield, Missouri
James C. Hale Co., Los Angeles, San Francisco • R. S. Gold, Toronto

Department of Commerce recently when he ended a temporary industrial mobilization assignment with the BUSINESS AND DEFENSE SERVICES ADMINISTRATION. Mr. Richards had been assistant director for mobilization planning, container and packaging division of BDSA.

The FOOD AND DRUG ADMINISTRATION *has suspended the penalty provisions of the Federal Hazardous Substances Labeling Act until February 1, 1962 for all hazardous substances other than highly toxic, extremely flammable, and flammable. However, the Federal Caustic Poison Act remains in full force and effect during the period of this extension for any article affected thereby, according to FDA.*

Reason for the extension is to give time to consider comments from associations, firms, and individuals prior to issuing final regulations.

Dollars and cents:

For the first six months of 1961, CELANESE CORP. OF AMERICA's net income amounted to $8,621,439 and sales $133,515,997. For the first six months of 1960, net income totaled $10,054,290 and sales $137,453,943.

PEERLESS TUBE CO. *reports net earnings of $144,958 on sales of $2,874,273 for the first six months of 1961, compared to earnings of $116,822 and sales of $5,028,928 for the entire year of 1960.*

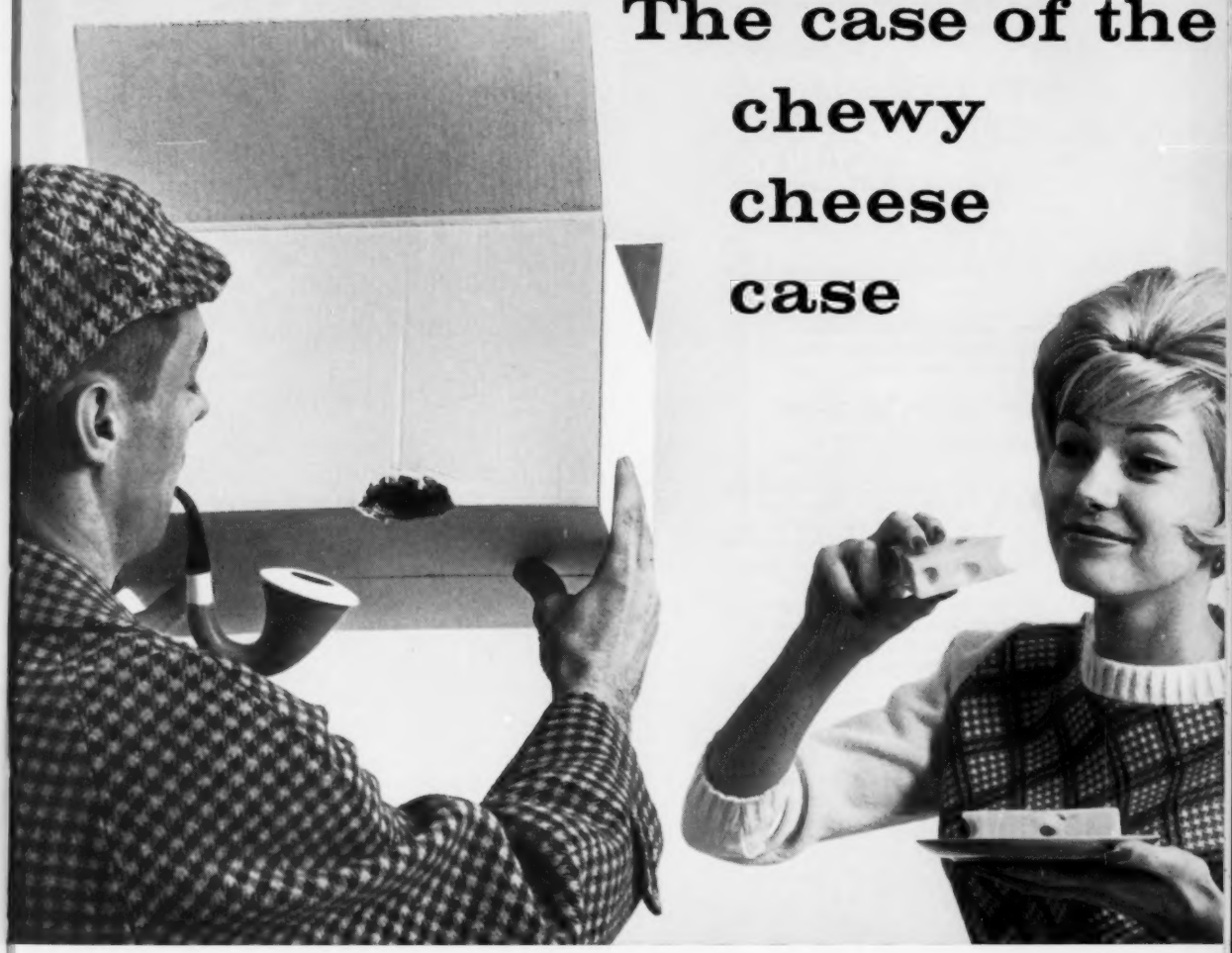
PHILLIPS PETROLEUM CO.'s net income increased to $54,902,000 in the first half of 1961, compared with $51,748,000 for the same 1960 period.

AMERICAN CAN CO. earnings for the first half of 1961 totaled $20,339,000, an increase of 17.3 per cent over the comparable 1960 total of $17,342,000. First half sales in 1961 totaled $512,374,000, an increase of 2.9 per cent over the 1960 total of $498,060,000.

For the first half of 1961, OLIN MATHIESON CHEMICAL CORP.*'s sales were $349,730,000, 0.4 per cent higher than the $348,281,000 in the comparable 1960 period. Net profits*

(Continued on Page 18)

The case of the chewy cheese case



MISS WATSON: *Fearless, I know this cheese is delicious! But who would bite the case?*

FEARLESS FULLER: Must be someone with excess of zeal, Miss Watson. You'll have to admit the whiteness and freshness of this cheese case makes for an appetizing package.

MISS WATSON: *Fearless, weren't cheese cases always so tasty looking?*

FEARLESS FULLER: Not always. Box makers often have used a dark glued lap adhesive because the white adhesives *were* pretty expensive. Every so often the application machinery would squeeze out the dark adhesive and discolor the case.

MISS WATSON: *Oh, but this box looks perfect!*

FEARLESS FULLER: *It should be!* It's sealed with Fuller #1594, a new white synthetic resin glue. It costs less than other white glues—and just a slice more than the brown glues. And it's as invisible as you are after 5 o'clock.

MISS WATSON: *Oh, I bet your customer was happy!*

FEARLESS FULLER: Miss Watson, the box maker was happy and the Cheese King was overjoyed! More people will "say" cheese again.

MISS WATSON: *Oh Fearless, you're so . . . so . . . masterful!*

FEARLESS FULLER: We Fuller Men are masters of our customer's adhesives problems, Miss Watson!

Got an adhesive problem? Call your nearby H. B. Fuller plant—and ask for "Fearless" Fuller.

H. B. Fuller Co.

INDUSTRIAL ADHESIVES

St. Paul, Minn., MI 6-8641 • Kansas City, Kansas, FI 2-3615 • Dallas, Texas, RI 7-7315 • Cincinnati 23, Ohio, MU 1-5420 • Detroit, Mich., LO 7-5980 • Atlanta, Ga., MA 2-3502 • Tampa, Fla., 45814 • So. San Francisco, Calif., PL 6-5450 • Portland, Ore., CA 6-3493 • Los Angeles, Calif., AN 3-2113 • Chicago 22, Ill., MI 2-6300 • Buffalo 7, N. Y., TR 5-6366 • Memphis 7, Tenn., JA 6-4212 • Linden, N. J., WA 5-2272 • Also Toronto, Ont., Can. • Winnipeg, Man., Can. • Fuller Adhesives International, Nassau, Bahamas

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THE C. F. SAUER COMPANY

SOLE OWNERS AND M'F'R'S SAUER'S EXTRACTS

HIGHEST AMERICAN AND EUROPEAN AWARDS
CABLE ADDRESS SAUER RICHMOND

IMPORTERS OF VANILLA BEANS
ETC. MFRS OF SPECIAL BRANDS
EXTRACTS & DRUGS

DUKE'S MAYONNAISE PRODUCTS

SAUER'S SPICES

RICHMOND 20, VA.

May 2, 1961

New Jersey Machine Corp.
16th Street & Willow Avenue
Hoboken, New Jersey

Attention Mr. Dave Goddard

Gentlemen:

With reference to your letter of April 27, 1961, concerning the service of your Model 386 front and back Pony Express labeler, please be advised that we have had very satisfactory results in labeling our glass line of spices on this machine. The machine has been utilized in both front and front and back labeling and the registration has been very good.

As far as changeover from one type glass and label to another is concerned, the machine is simple to change and our operators have been very well pleased with the results in changing from one size to the other. We lose very little production time in changing from one size container to the other.

To date, we have run this machine up to 65 jars per minute and have had no unusual troubles. Our operators can change the above machine completely for front and back labeling in approximately 30 minutes. The machine does not require a full time operator since it has a sufficiently large label magazine. An operator should be close at hand to observe the machine and stop same if something along the line jams. This could be eliminated with an automatic control on the infeed to the machine.

Best regards.

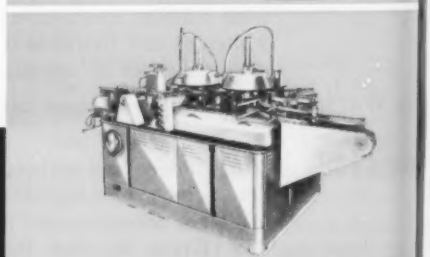
Yours very truly,

THE C. F. SAUER COMPANY

F. F. Jewett mp

F. F. Jewett
Vice President

FFJ/np



Max. Label Width	4-7/8"	4-1/2"	
Max. Container Dia. or Thickness	4-1/4"	3-3/4"	3-1/2"
Speed	65/min.	75/min.	80/min.

THANKS, MR. JEWETT, FOR YOUR KIND WORDS.
As in Mr. Jewett's case, the accurate register and quick changeover inherent in our double turret Pony Express suction labeler can probably help you, too • Send for information or call our sales engineer.

Labeling, Cartoning, Paper Box Machinery

NEW JERSEY MACHINE CORPORATION

MAIN OFFICE AND PLANT • 16TH ST. AND WILLOW AVENUE, HOBOKEN, N. J. • OLDFIELD 9-0483
FACTORY SALES AND SERVICE BRANCHES: 325 W. HURON ST., CHICAGO 10, ILLINOIS, 2500 W. 8TH ST., LOS ANGELES 57, CALIFORNIA

These are examples of the finely detailed, eye-catching caps and closures that are injection-molded for Avon Products by Mack Molding Company of Wayne, New Jersey.

for Avon Products it's

AVISUN
polypropylene

In AviSun polypropylene, Avon Products finds all the properties needed for colorful and durable caps and closures.

1. CHEMICAL RESISTANCE AviSun polypropylene surpasses most materials in ability to withstand the alcohols, volatile aromatics and high percentages of essential oils present in many beauty preparations.

2. TOUGHNESS Shown to have less breakage than the plastic formerly regarded as most durable. Threads in polypropylene caps aren't damaged by over-tightening—and "memory" restores their original form. Polypropylene has resilient toughness—even deeply detailed caps and closures are readily removed from standard molds.

3. COLORFUL APPEAL Outstanding gloss, smoothness, feel and abrasion resistance. The colors stay true through long shelf life and handling.

4. ECONOMY Low-priced, the lightest of all plastics, and strong enough to be fabricated with thinner sections than other materials. Customers get more pieces per pound for an amazingly low unit cost.

The same properties that make polypropylene valuable for closures and caps can be utilized in your products. Call on AviSun for complete material specifications and for any needed technical assistance.

AVISUN*

*a trademark of AviSun Corp.

Mail coupon for technical information
AVISUN CORPORATION
Dept. 565, 1345 Chestnut St.
Philadelphia 7, Pa.
Send me Booklet AP-601 covering full technical information on AviSun Polypropylene.

NAME_____
(Please Print)
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

were $14,402,000, 22.8 per cent below the $18,666,000 earnings of 1960's first half.

For the year ended June 30, PACKAGING CORP. OF AMERICA reports sales of $128,700,000 and earnings of $4,090,000. For the year ended June 30, 1960, sales were $138,278,790 and earnings $6,510,000.

SPENCER CHEMICAL CO. reports that sales for the year ended June 30, 1961 rose to a new high of $79,053,961, compared with $74,094,050 for the previous year. Net income rose to $6,868,410, compared with $6,702,148 the preceding year.

Net sales of ST. REGIS PAPER CO. *for the first six months of 1961 amounted to $8,567,200, compared with $262,941,356 for the first half of 1960. Net earnings amounted to $8,576,200, compared to $12,350,597 for 1960's first half.*

For the 24 weeks ended June 17, FEDERAL PAPER BOARD CO., INC. reports income of $1,414,000, compared with $1,782,000 for the comparable 1960 period. Sales were $39,551,000, compared with $41,090,000 for the 1960 period.

CROWN ZELLERBACH CORP.'s sales during the first six months of 1961 were $275,515,000, compared with $275,737,000 for the 1960 period. Earnings for the first half of the year were $18,210,000, a decline of 10.3 per cent from the $20,295,earned during the first six months of 1960.

DIAMOND NATIONAL CORP's *net income for the 24 weeks ended June 18, 1961 amounted to $6,516,000, compared with $7,096,000 for the similar 1960 period. Net sales for the first 24 weeks this year totaled $108,196,000, compared with $113,581,000 for the same 1960 period.*

NATIONAL STARCH AND CHEMICAL CORP. reports sales of $32,759,561 and income of $1,875,143 for the first half of 1961. The same 1960 period showed sales of $30,545,665 and earnings of $1,670,043.

THE MEAD CORP. reports earnings of $5,630,953 and sales of $166,601,493 for the 24 weeks ended June 11. For the same 1960 period earnings were $6,765,151 and sales were $160,959,691.

More expansion for packaging:

NEW JERSEY MACHINE CORP. *has purchased the principal assets of* HIGH PRODUCTION MACHINE CO. *from its parent organization, the* EX-CELL-O CORP., *Detroit. Transfer of the property to Hoboken will take about five months.*

SPENCER CHEMICAL CO. has acquired all the assets of PERKINS GLUE CO. in exchange for common stocks. Perkins will be operated as a wholly owned subsidiary. Spencer has also acquired two packaging materials manufacturers: CRYSTAL TUBE CORP. of Chicago and FLEXICRAFT INDUSTRIES, INC. of New York.

To double its present manufacturing capacity, BROWN MACHINE CO. is building an 18,000-sq.-ft. building to include factory and office facilities, warehouse space, and storage docks.

EKCO-ALCOA CONTAINERS INC. *has acquired the business, equipment, and patents of* ALCOA-UNITED UNIT CONTAINER CO.—*a joint-venture company operated by Aluminum Co. of America and United Shoe Machinery Co.*

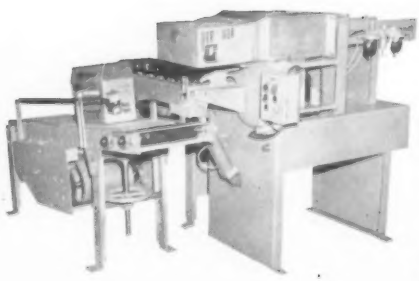
To expand production of blow-molded plastic containers, CELANESE PLASTICS CO. is building a plant in Batavia, Ill. Upon completion in October, production will be transferred to Batavia from the present plant in Chicago. In the East, Celanese will transfer production from its Trenton, N.J. plant to a recently purchased plant in New Castle, Del. which offers double the manufacturing area.

PHOTOMATION, INC. is moving its executive, manufacturing, and engineering facilities from Bergenfield, N.J. to Mountain View, Calif.

ATRONIC PRODUCTS INC. *has merged into* GENERAL ATRONICS CORP., *which formerly operated Atronic Products as a wholly owned subsidiary.*

KAISER ALUMINUM & CHEMICAL CORP. at Trentwood, Wash. has

at industry's request...



Standard-Knapp Type 806 Package Packer has been redesigned to handle a wider range of carton sizes. Same proven efficiency with improved adjustability. Please write for bulletin TP-394C. Emhart Manufacturing Company, Portland Division, Portland, Conn.

EMHART

For more information circle No. 214 on Reader Service Card

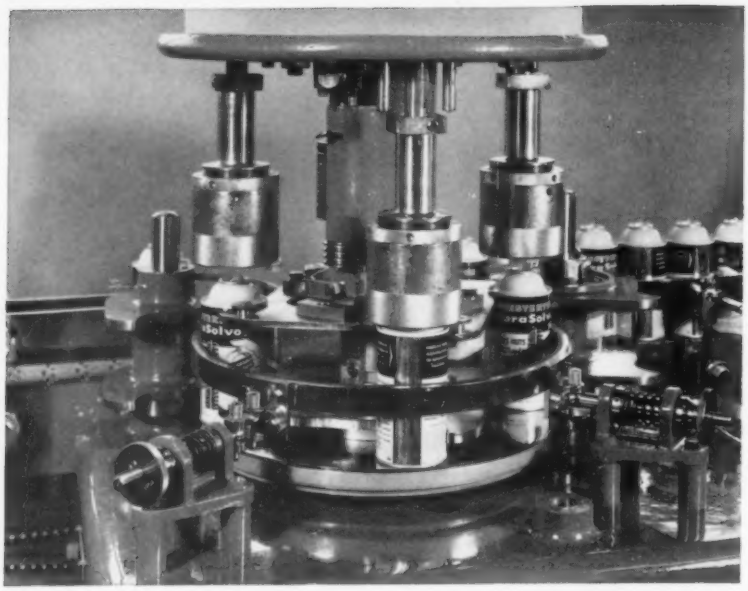
Circle No. 215 on Card ►

No more lumps
in brown sugar!
No more caking!
C & H offers
housewives this new
convenience, and gives
"Golden Brown Sugar"
and "Velvet Smooth
Powdered Sugar"
new impact at
the point of sale.
Packaging: moistureproof
polyethylene custom bags
produced and printed
by Dobeckmun.

packages for performance

DOBECKMUN

Catch more customers with eye-catching, convenient polyethylene custom bags! Polyethylene locks out moisture-laden air, prevents lumping and caking—even with brown and powdered sugars. A handy plastic device recloses the bags, and they mold easily to fit canisters. Seal them with heat and ship them with confidence. Polyethylene custom bags are typical of the many fine packages produced by Dobeckmun, where experience solves problems better. Call your representative or write to THE DOBECKMUN COMPANY, a Division of The Dow Chemical Company, Cleveland 1, Ohio • Berkeley 10, California • Offices in most principal cities.



OVER 1,000,000 CANS ....and going STRONG

A recent customer reports the new CAPEM Automatic Rotary Crimper for Aerosol Valves delivers more than a million cans without a sign of jaw or plunger wear or misalignment. The crimper assembly holds well within crimping tolerance throughout the entire run.

The machine features a completely mechanical operation . . . no *air* required. During the crimping operation, a mechanical plunger drops over the valve and expands 6 precision-tooled segments for crimping contact. When the plunger retracts, the segments snap back into position for positive release of the can *before top pressure is released*. The crimping operation is further protected by Consolidated's built-in accuracy of container handling and centering, with automatic pre-seating of unseated valves.

Crimper jaws are adjustable to provide depth of crimp desired. The machine, with adjustable turret, can be easily set for proper crimp height and top pressure.

The Model C-4-SC, 4-spindle operation shown, will handle any size can with standard 1" valve at speeds of 110 to 120 containers a minute. Faster six and eight spindle machines are available.

SEE THIS NEW **CAPEM** AUTOMATIC ROTARY CRIMPER AT THE PACKAGING SHOW NOVEMBER 7 to 10 DETROIT

For complete information, write Sales Manager

CONSOLIDATED PACKAGING MACHINERY CORPORATION

A Subsidiary of International Paper Company

1400 West Avenue • Buffalo 13, New York

completed an automatic facility to process aluminum sheet and coil for the can manufacturing industry. Kaiser expects that aluminum used for cans will increase from 40 million lb. in 1960 to 100 million lb. during 1961.

What people are doing:

Frank Golden will fill the newly created position of general manager of domestic purchasing and packaging for Chesebrough-Pond's Inc. Mr. Golden was manager of packaging and merchandise services for General Foods Corp. for the past five years.

Arthur Heckle *has joined Diamond Laboratories as packaging supervisor. He was formerly with Grove Laboratories, where he spent 11 years in the packaging department.*

George J. Hill is the new laboratory director at Arnold Bakers, Inc.

The new supervisor of Rexall Chemical Co.'s sales service laboratory is John H. Myers. He was previously in applications development for Foster Grant Co., Inc.

Howard C. Blake III *has joined the staff of the school of packaging at Michigan State University as a research associate. He will be directly concerned with the work under the university's multi-sponsor packaging research program. An MSU graduate, Mr. Blake was formerly with Reed Research, Inc., Washington, D.C.*

At Doughboy Industries, Inc., James H. Buell, vice president and controller, replaces E. R. Livingston as vice president and general manager. Mr. Livingston has retired because of ill health.

Manager for Package Machinery Co.'s newly organized department of foreign operations is John M. Chalfant. Mr. Chalfant has been with the company 24 years and most recently served as export manager.

Anthony J. Testa *has joined the Dewey and Almy Chemical Div. of W. R. Grace & Co. as chemist in the container and chemical specialties division.* *(End)*

How Lord Baltimore helps package 62,000 fish sticks every hour

WHETHER your business is fish sticks or cookies or cosmetics, Lord Baltimore can design a more efficient packaging system for you.

The Dex-O-Pak® system we installed for Gorton's is just one example of how our service extends beyond the creation of award-winning printed cartons. This remarkable system unscrambles and packages 62,000 fish sticks every hour.

For *any* volume product we can design a high-speed packaging system. Our nationwide engineering program includes installation, regular servicing, operational training, and maintenance.

We also offer matched nationwide facilities, including offset lithography, multicolor rotogravure and letterpress. Plus a complete selection of decorative and protective finishes, embossing and other special effects. And we are backed by the complete resources of International Paper's mills and research centers.

All of this can be focused on your packaging problems.

For information, write: 425 Park Ave., N. Y. 22, N. Y., San Mateo, Calif., or 333 N. Michigan Avenue, Chicago, Ill.

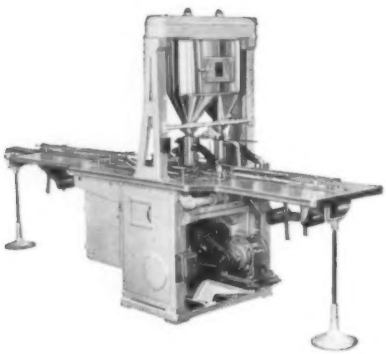
Lord Baltimore Press

PLANTS: BALTIMORE, MARYLAND • CLINTON, IOWA • SAN LEANDRO, CALIFORNIA

AFFILIATED PLANTS: MEXICO CITY: ENVASES AZTLAN • SAN JUAN: PUERTO RICO PACKAGING COMPANY LIMITED

FMC Auger Fillers meet high-quality standards for Chesebrough-Pond's

Chesebrough-Pond's Inc., has long been well-known in the cosmetic industry for products of the highest quality. For many years they have used FMC Auger Fillers to meet the high standards they maintain for their powder and talc products. Ten FMC automatic and semi-automatic fillers of three different types fill a wide variety of sizes and kinds of containers from gold-finished metal canisters to lithographed paperboard drums.



The Duplex Auger Filler model HG-84 is one of the FMC units installed at the Chesebrough-Pond's plant in Clinton, Connecticut. Completely automatic, this model is designed with a choice of filling methods—cam volumetric, gross weighing, or auger combined with vacuum for pack filling dusty products—at speeds up to 70 containers per minute. Many other models are available for large or small plants, automatic or semi-automatic operation, tight or loose fills, long or short runs to handle powders, granules, and certain pastes. Production run accuracy has proved outstanding in filling cans, jars, boxes, bags, etc. from ½ oz. to 20 lb. Changeover for product and size is exceptionally fast and simple. Speeds as high as 140 per minute.

Putting Ideas to Work

fmc

FOOD MACHINERY AND CHEMICAL CORPORATION

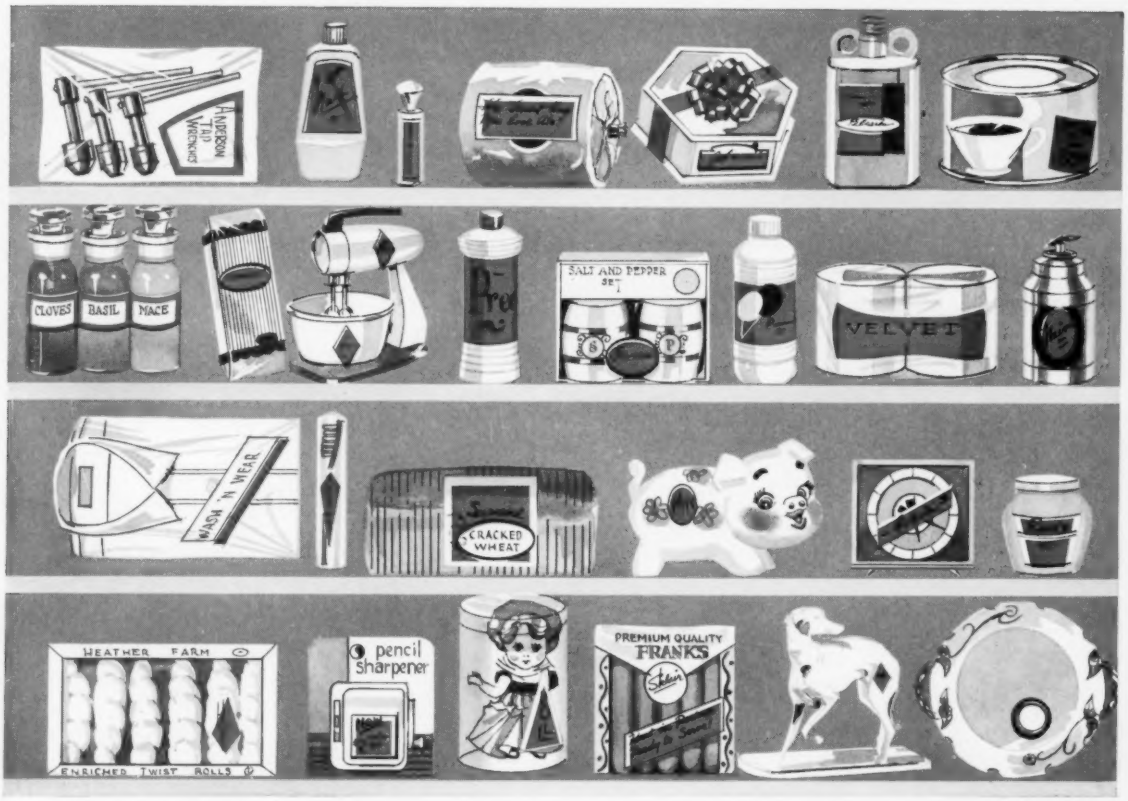
FMC Packaging Machinery Division

Stokes & Smith Plant

4994 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

For the whole story of how FMC Auger Fillers can improve your packaging, write for Bulletin P-811.

If you can package it...
Label-Aire can label it!



KLEEN-STIK®
JET-ACTION LABEL-AIRE

the only *Fully Automatic* pressure-sensitive label applicator that handles all these "problem" jobs

The *world's simplest* labeling method is also the world's most versatile! New "Label-Aire" handles *any size or shape* of label on *any type* of product or package — even hard-to-label irregular shapes and delicate materials. In Label-Aire's exclusive "Jet Action", incoming air jet picks up single label from roll . . . outgoing jet expels it into exact position desired — all with amazing speed and accuracy. Mounts directly into production line from top, bottom, side, or angle. Give *your* difficult labeling operations *jet-age speed* with the Kleen-Stik "Jet-Action" Label-Aire!

- Eliminates heat, water, glue, hand labeling!
- Feeders, stackers, conveyors and other special engineering accessories available
- Manufactured and guaranteed by Kleen-Stik —pioneer and leader in pressure-sensitives
- Available on Lease — no heavy investment

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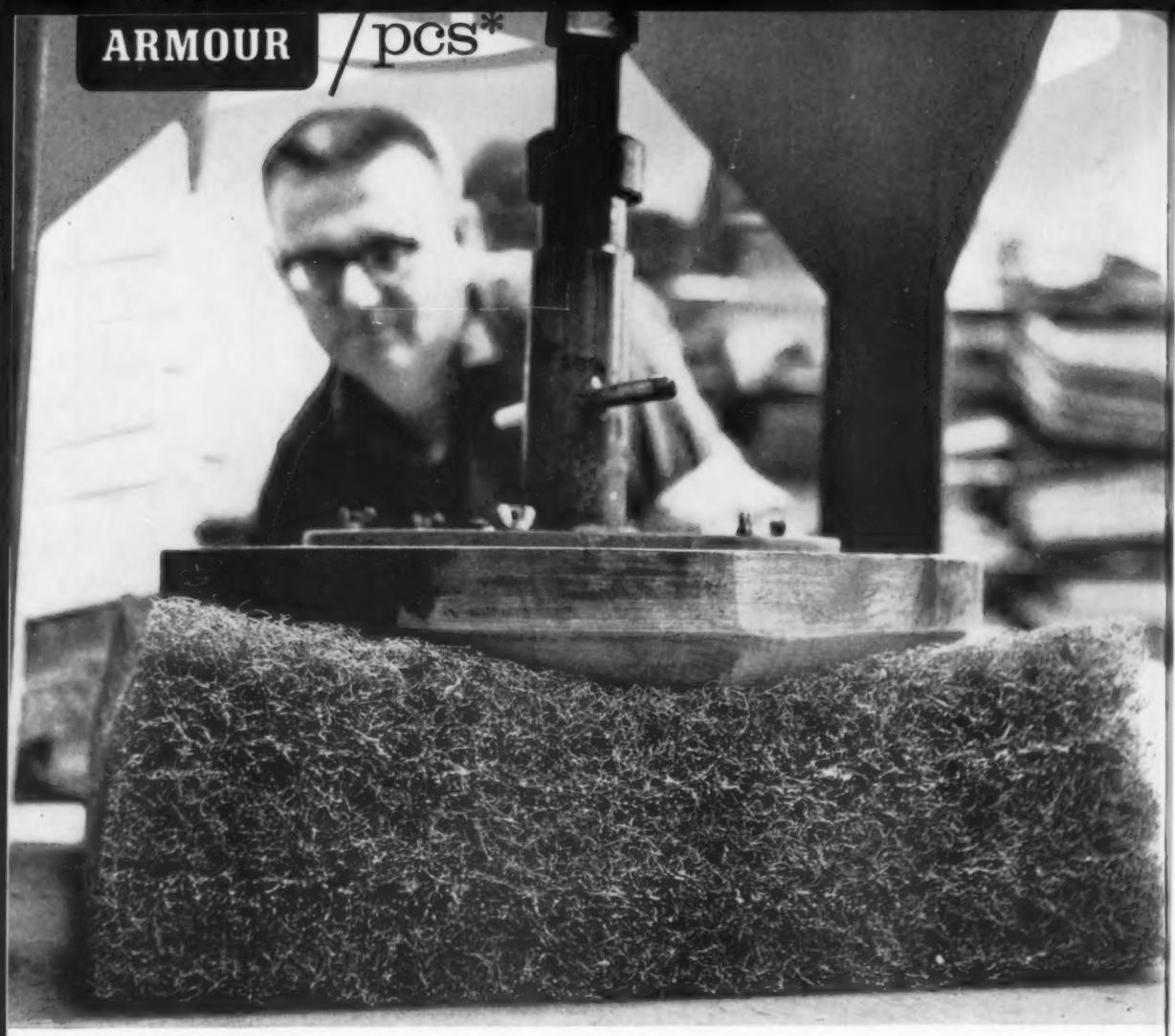
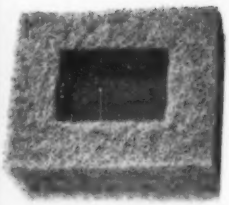
PLANTS IN CHICAGO, NEW YORK, LOS ANGELES, AND TORONTO, CANADA

ARMOUR /pcs*



*protective cushioning service studies the bumps to protect your product



Special Hairflex packs can be fabricated to pillow your product.

Calculating the precise characteristics necessary for your product's protective cushioning is a job for Armour/pcs. Armour's expert package engineers are ready to assist you with the technical skills and modern equipment necessary to design and fabricate a protective pack that cuts shipping hazards to the minimum.

As the leader in processing and fabricating Hairflex—the rubberized curled hair for critical packaging applications—Armour/pcs can bring unmatched skill, experience and facilities to bear on your problem.

If you ship a fragile high-value product, Armour/pcs can help you reduce in-transit damage. Take advantage of this comprehensive technical service. For your free copy of our brochure describing Hairflex for packaging applications, write to: Cushioning Products Division, 16123 Armour Street, N.E., Alliance, Ohio, or 2001 Saybrook Avenue, Los Angeles, California.

CUSHIONING PRODUCTS DIVISION
ARMOUR ALLIANCE INDUSTRIES

For more information circle No. 220 on Reader Service Card

Hayssen Machines Cut Frozen Food Packaging Costs

Whether you package your frozen products in overwrapped cartons or in sealed flexible bags, Hayssen has the answer to your cost and efficiency problems! Hayssen's complete line of flexible packaging equipment — overwrapping machines and bag making, filling, sealing machines — is sure to provide a model to fill your specific requirements.

Hayssen overwrappers handle any type carton — box, tray, U-board — with any heat or adhesive seal wrapping material. Electric eye registration, imprinter-coder attachment and convenient adjustment controls add flexibility and economy to your packaging line.

Hayssen COMPAK flexible bag machines feature five automatic feed systems — net weight scale, liquid pump, auger, volumetric and elevator — to assure fast efficient packaging of any type product. COMPAK's many optional features — from multiple unit to gas fill packaging — increase productivity.

Get full details on Hayssen Frozen Food packaging machines — call or write your nearby Hayssen Representative today!

attractively protected--

by Hayssen Packaging Machines

All Hayssen packaging machines have something in common — they produce packages which appeal to your customers as well as protect your product! Whether you sell industrial or consumer products, a Hayssen packaging machine will give you a handsomer, more durable package. Hayssen machines package liquids, powders, granules, solids or soft goods in paper, film, foil, metal or glass. Rather broad area, we admit, so why not call your nearest Hayssen Representative for specific information on which Hayssen machine meets your individual needs! There is no charge or obligation for this service. Just look in the Yellow Pages under Packaging Machinery!

Exclusively Manufacturers of Packaging Machines Since 1910

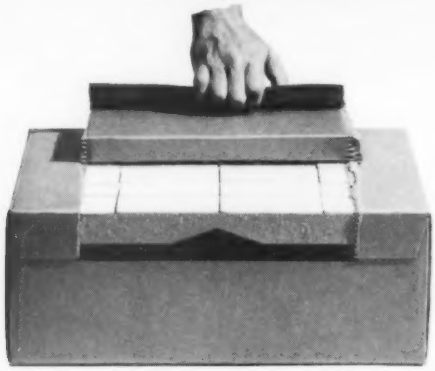
HAYSSEN

MANUFACTURING COMPANY • SHEBOYGAN, WISCONSIN

Offices in principal cities. Check your phone directory.

ATLANTA • BOSTON • CHICAGO • COLUMBUS • DALLAS • DENVER • DETROIT • EVANSVILLE, IND. • JACKSON, MISS. • KANSAS CITY • LOS ANGELES
MINNEAPOLIS • NEW YORK • PHILADELPHIA • ST. LOUIS • SAN FRANCISCO • MONTREAL • TORONTO • VANCOUVER • Offices in Principal Foreign Cities

Fibreboard's end-loading cases are as easy to open as



1 **Fibre Zip,** the glue-joint shipping case that opens quickly at the pull of a tab.

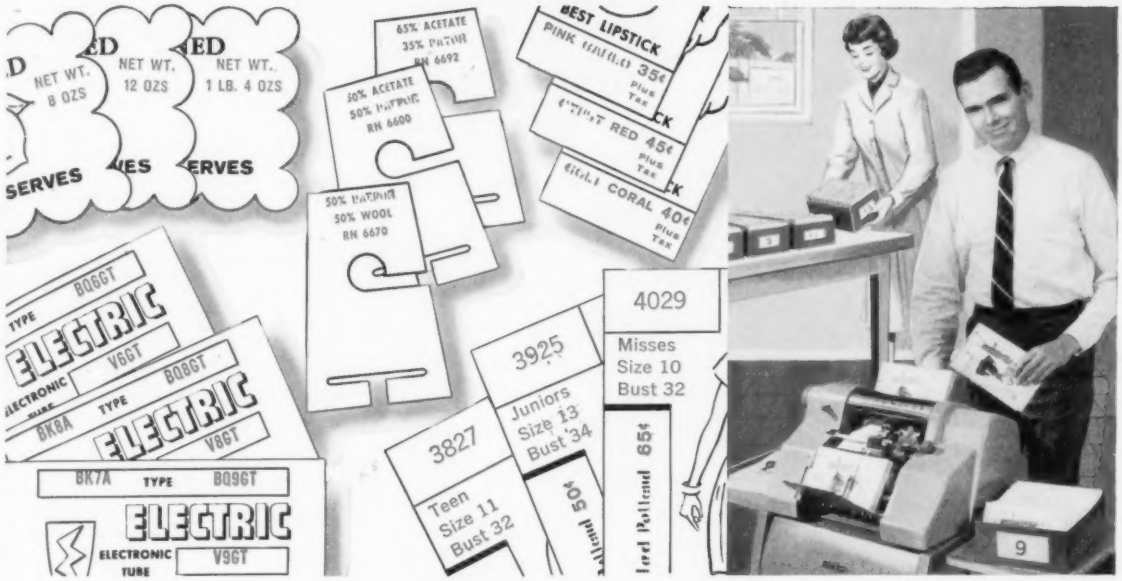
2 **M.T. Quik,** the glue-joint, flip-top shipping case. Pull the flap; the whole top half flips open. (No digging to remove contents.)

3 **Zip Ease,** the tape-joint shipping case. Pop the end flaps; the top zips open with a special tear-tape. (Closes neatly for storing, too.)

A Fibreboard specialist in *your* industry can help you get increased convenience with end-loading cases. (Plus maximum cost advantages, too.) How? To get information is as easy as writing: **Fibreboard Paper Products Corporation,** 475 Brannan Street, San Francisco 19.

Specification changes

no problem with Tickometer imprinting—



Changes in specifications usually scrap pre-printed packages, and may hold up production until new packages are available. / Stop packaging waste, reduce package inventories, save on printing costs by imprinting specifications for current production with a Tickometer. / It imprints weights, dates, colors, codes, ingredients, etc., on labels, bags, wrappers, light cartons – handles 400 to 1,000 items a minute. / Gives accurate register from rubber mats, type or electros. Takes all standard weights and finishes of paper and light board stock. Feeds and stacks automatically. Is easy to use. / The Tickometer is also a precision counter, so accurate banks use it to count currency. / Leased or sold. Pitney-Bowes service from 320 points. Call the nearest PB office for a demonstration. Or send coupon.

Pitney-Bowes

TICKOMETER

Imprinting & Counting Machine

Made by the originator of the postage meter . . .
149 offices in U. S. and Canada.

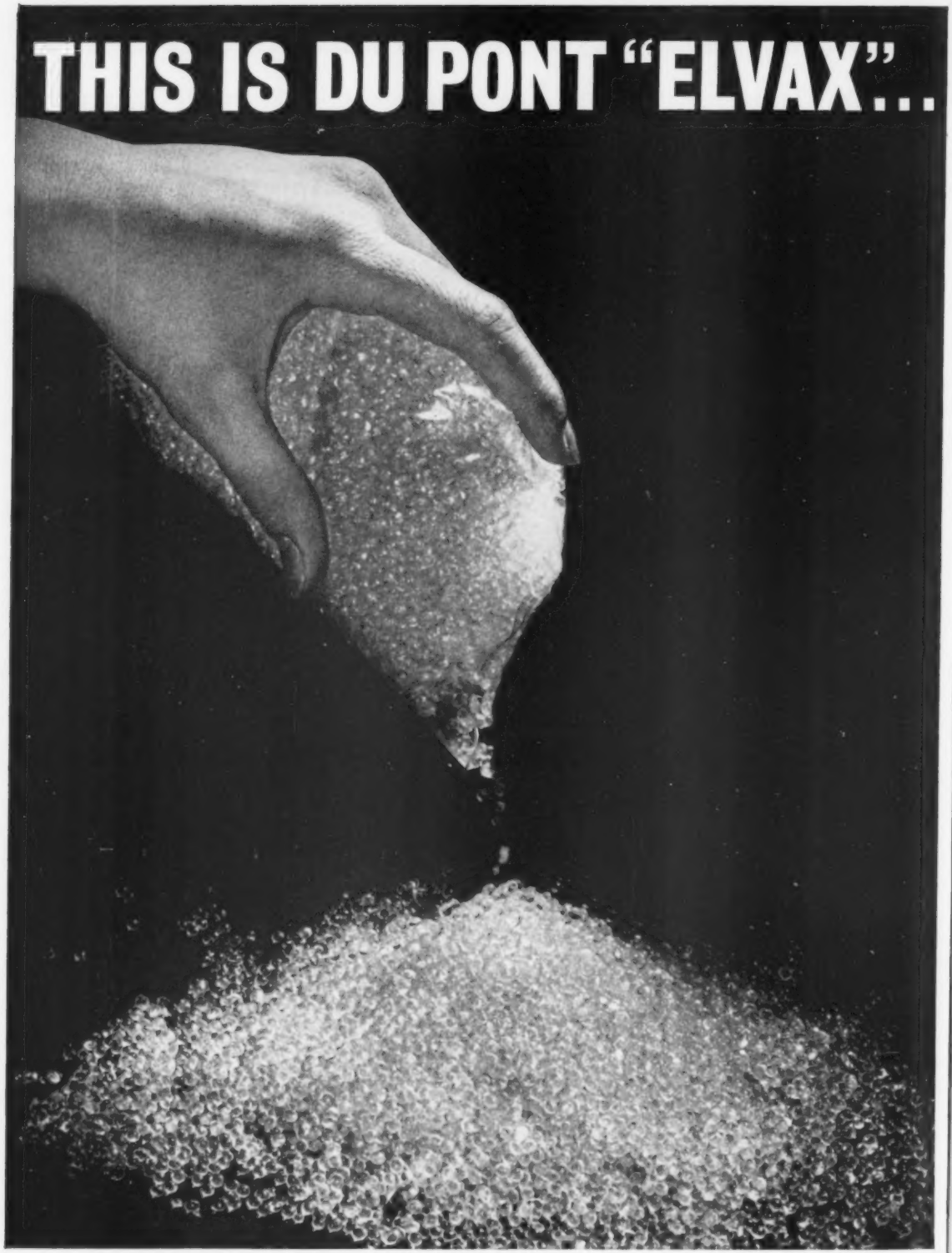
PITNEY-BOWES, INC.
7744 Walnut Street
Stamford, Conn.

Send Tickometer booklet and case studies.

*Name*_____

*Address*_____

THIS IS DU PONT "ELVAX"...



"ELVAX" vinyl resins are translucent, free-flowing pellets that blend readily with wax to form strong, flexible coatings for a wide variety of packaging materials. "Elvax" blends are easy to apply by hot-roll, curtain or solvent-coating techniques.

a new vinyl resin that gives wax greater versatility in packaging

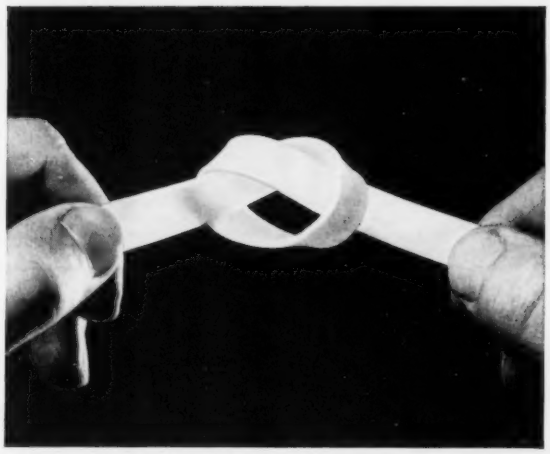
"Elvax" is a new, high-molecular-weight vinyl resin that makes possible low-cost wax coatings of superior adhesion, flexibility and toughness with excellent water-barrier properties.

With "Elvax" you can, for the first time, control the water-vapor transmission rate (WVTR) of wax coatings simply by varying the ratio of "Elvax" to wax. As little as 5% of "Elvax" added to wax reduces the creased WVTR of unmodified wax coatings by 50% without impairing the flat WVTR. In addition, resistance to grease penetration is improved significantly. When 40% "Elvax" is blended with wax, flexible 1-mil coatings with flat and creased WVTRs of 0.2-0.4 gms./100 in.^{2}/24 hours are obtainable.

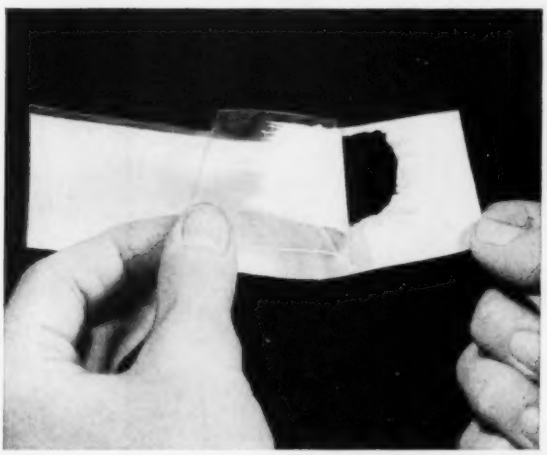
You can obtain tough, flexible adhesive bonds using "Elvax" alone or combining it with waxes, resins, rosins and rosin derivatives. "Elvax" exhibits strong adhesion because of the chemically active polar groups in its molecules. Flexibility and toughness (see upper right) result from its rubber-like, noncrystalline structure and high molecular weight. Hot-melt, solvent and pressure-sensitive adhesives based on "Elvax" adhere tightly to all films used in packaging today (see right).

Since "Elvax" will be used in food packaging applications, Du Pont is currently completing a nineteen-month study which will be used to petition the FDA for permission to use "Elvax" where contact with food is concerned.

You can order "Elvax" now in commercial or evaluation quantities. Our new booklet on "Elvax" provides information on properties and application methods . . . suggests possible uses. Write: Du Pont, Electrochemicals Dept., Vinyl Products Division, Room N-2533, Wilmington 98, Delaware.



FLEXIBILITY is demonstrated by tying a strip of paraffin wax, blended with 40% "Elvax", into a knot. When "Elvax" is added, the strip becomes plastic...will take 50% elongation before it breaks . . . is flexible at –20°F.



ADHESIVE STRENGTH of wax extended with 40% "Elvax" is shown by the fiber-tearing bond obtained when paper coated with "Elvax"/wax is heat-sealed to polyethylene. Coatings based on "Elvax" heat-seal to all films used in packaging today.

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

"ELVAX"
VINYL RESINS

"WORK HORSES"

When the line runs, capacity counts! Illumitronic Checkweighers . . . Weight Monitors and Classifiers are rugged, accurate, and consistent performers in demanding environmental conditions. These machines are operating with cartons, bags, cans, pouches, tubes, trays, overwraps, blow-mold plastics, and products unsupported by packages. Speeds to 300 units per minute. Accuracy ±1/30th of 1 oz. Weights to 10 lbs. Investigate the economies of *automatically weighing in motion with featherweight accuracy!*

Write—or dial 415, RE 9-2395

illumitronic systems corp.

680 East Taylor Sunnyvale, California

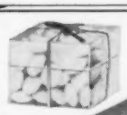
Time for a new look in **your** packaging? J-E, the nation's largest designer-producer of semi-rigid plastic packaging, is the first place to look for the package of distinction. Sparkling transparency, multi-color graphics, precise specifications **and** large scale automatic equipment for fast delivery combine to make J-E the pace setter.

Our famous acetate containers transform the most mundane product into a gift — and our pressure-formed FDA-approved oriented styrene containers have opened a new era in food merchandising. Imagine — plastic containers which retain their shape and good looks in long term sub-freezing and short term boiling temperatures!

Whether your product is a paint brush or a prepared dinner . . . a shoestring or a seafood salad . . . J-E's economical containers can put sparkle in your sales!

Frozen Food...
or Fountain Pens

everything looks better... sells faster ...in a J-E container



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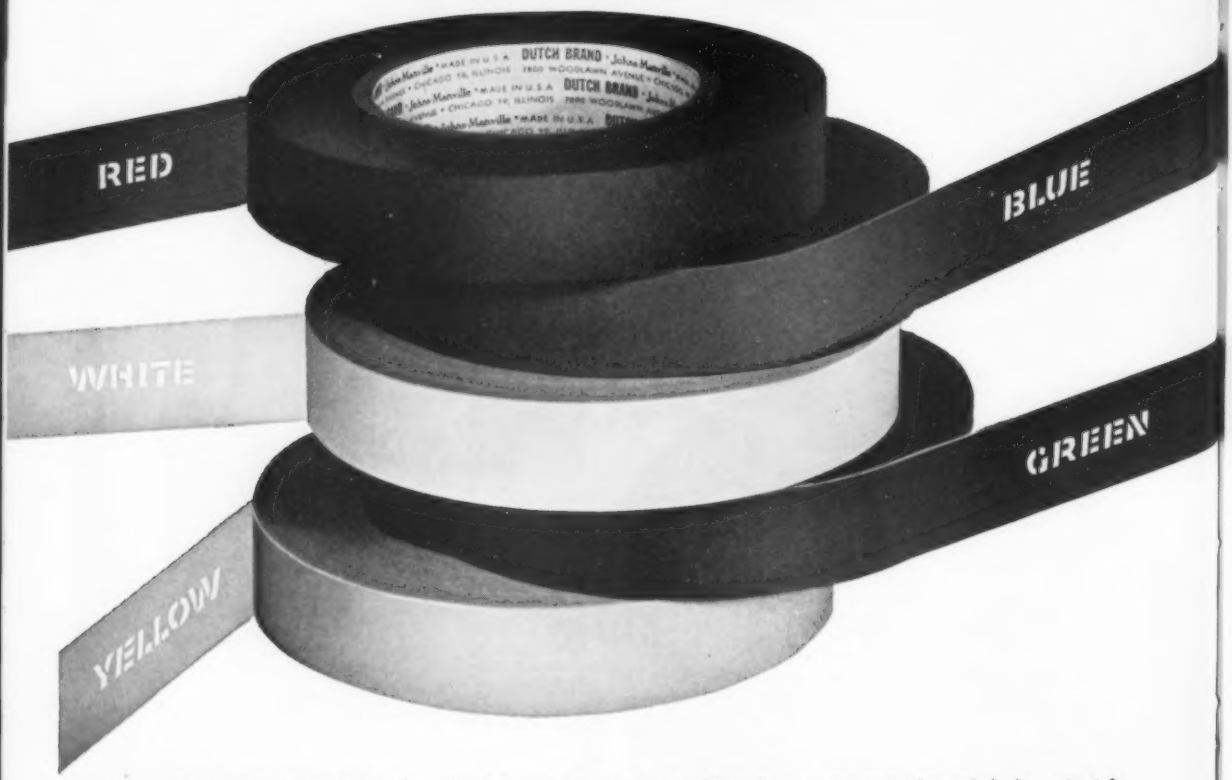
OUR PRODUCT IS_____

PLEASE SEND YOUR ILLUSTRATED CATALOG OF IDEAS FOR PACKAGING IN PLASTIC_____

J-E PLASTICS MANUFACTURING CORP.
400 Nepperhan Avenue, Yonkers, N.Y. • Phone: GR 6-3456

New from Johns-Manville!

Low-cost paper packaging tape in 5 vivid colors!



Meet new Johns-Manville Dutch Brand Paper Packaging Tape – the low-cost, dependable way to color-code packages and bundle "combination deals."

Five eye-catching colors – red, green, blue, white, and yellow–make this economical tape an ideal color-coding medium. And the semi-gloss surface of this J-M Dutch Brand Tape speeds in-store marking because the tape can be quickly, clearly marked with ink, pencil, marking crayon or rubber stamp.

Strong and dependable, J-M Dutch Brand Paper Packaging Tape has a tensile strength of 50 pounds per inch of width... features a pressure-sensitive adhesive that grips instantly, holds tenaciously. Flat-back construction minimizes stretch.

Available in standard 60-yard rolls, J-M Dutch Brand® Colored Paper Packaging Tape comes in widths from ¼" up. Get complete details from your Dutch Brand Distributor. Or write Dutch Brand Division, Johns-Manville, Box 359, New York 16, N. Y. In Canada: Port Credit, Ont. Cable: Johnmanvil.

JOHNS-MANVILLE
DUTCH BRAND TAPES

JOHNS-MANVILLE JM PRODUCTS

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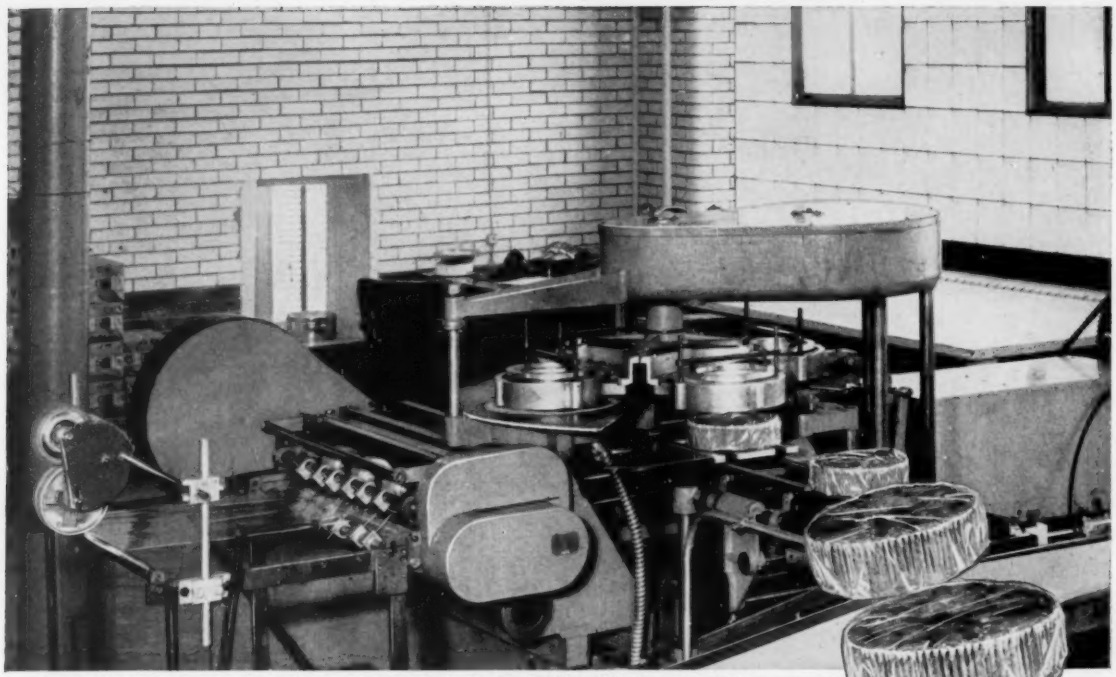


Tight, attractive overwrap for fruit cake is produced by the WRAP-KING CK/P-2 at rate of 54 per minute.

Wrap-King cuts production costs for Cakemasters of America, Inc.

Wrapping rate for fruitcake increased 300%; waste due to breakage reduced to 0.1%

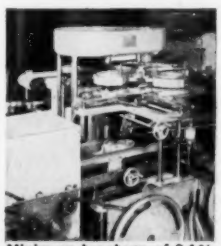
You may have a similar problem. Cakemasters of America, Inc., Chicago, were faced with rising production costs and excessive waste through breakage.

They required a tight, attractive cellophane overwrap for their increasingly popular fruit cake, and a high wrapping rate to match the oven output of 2½ million cakes during their May to December season. So, they turned to Crompton & Knowles Packaging Corporation for an automatic packaging system that would increase production efficiency while minimizing waste due to breakage.

The WRAP-KING Model CK/P-2 provided the answer. Operating at 54 cakes per minute, the CK/P-2 produced a bunch fold overwrap with a tight seal. Its handling of the product resulted in a product breakage of less than 0.1%. And the 300% increase in the wrapping rate produced the desired efficiency.

Says Mr. Larry Gordon, Production Superintendent, "High speed packaging of our fragile product, coupled with a significant reduction of product damage, has given us an efficient rate of production."

Cost reduction through high speed automatic packaging is the special ability of Crompton & Knowles Packaging. Whatever your particular requirements may be, from single machines to completely integrated lines, C & K know-how can provide the most efficient answer. For complete details, and leasing arrangements, write Wrap-King Division.



Minimum breakage of 0.1% is achieved by gentle, yet highly efficient, handling of fragile product on automatic, high-speed WRAP-KING.

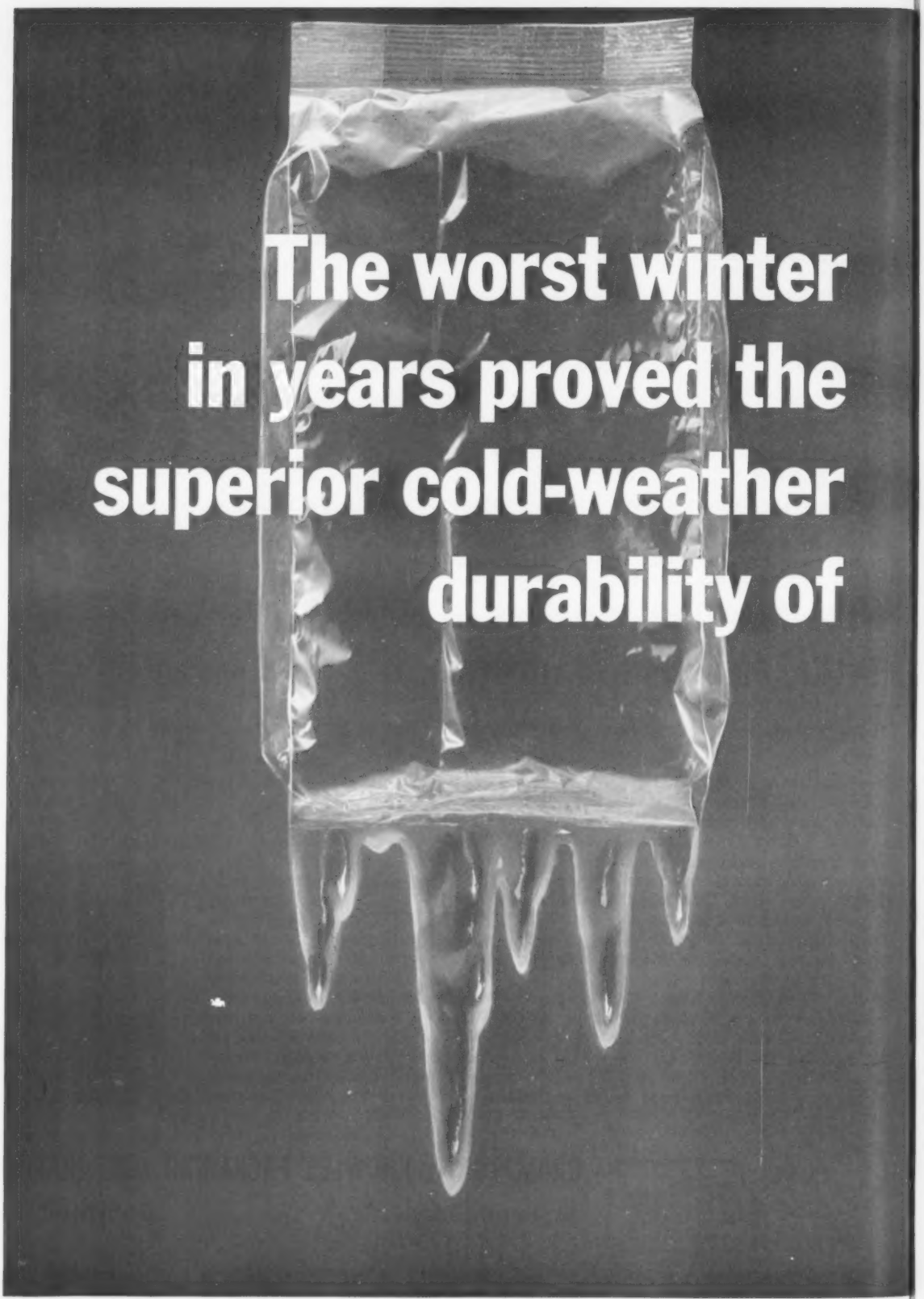
C&K Stands out in PACKAGING

REDINGTON AUTOMATIC MACHINES for CARTONING WRAPPING • SPECIAL PACKAGING

CROMPTON & KNOWLES PACKAGING CORPORATION

Agawam, Mass. **Bellwood, Ill.**

INTERNATIONAL SALES AND SERVICE OFFICES: NEW YORK CHICAGO CLEVELAND WINTERHAVEN, FLA. DALLAS ATLANTA TORONTO MONTREAL ZURICH LONDON: CLAVELL BATE AND NEPHEWS, LTD.


The worst winter
in years proved the
superior cold-weather
durability of

AVISCO® CELLOPHANE

Temperatures were below freezing. Thousands of trucks were delayed by deep snows. Many of these trucks carried products packaged in Avisco cellophane. How did this film perform in such abnormal cold? Wonderfully! While other films became brittle and breakage prevailed, Avisco cellophane remained tough. And little wonder. Prior to last winter, and without fanfare, an important improvement was made in the base sheet. It gave Avisco cellophane greater durability in below-freezing laboratory tests. *But only actual use under such severe conditions would prove this superiority.* Last winter did it—and in spades. If you were plagued by broken packages, plan now for the winter ahead. Choose the film with *proven* cold-weather durability—Avisco cellophane. Contact us for an appointment with our representative or a selected cellophane converter specializing in your field.

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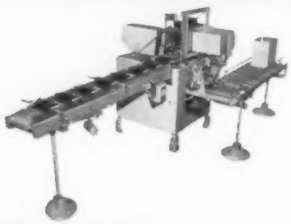
AMERICAN VISCOSE CORPORATION, FILM DIVISION, 1617 PENNSYLVANIA BLVD., PHILADELPHIA 3, PA.
SALES OFFICES ALSO LOCATED IN ATLANTA, BOSTON, CHICAGO, DALLAS, LOS ANGELES AND NEW YORK.

You'll get the Most in economical, automatic, high-speed operation

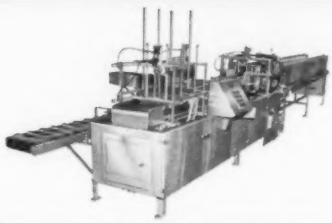
...with fmc

Can and Package Casers



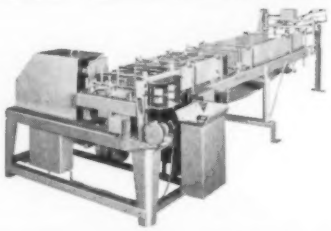
"SURE-WAY" PACKAGE CASER

Designed to convey, position, assemble and load packages into shipping cases in a continuous, high-speed automatic operation. Available in 11 different models for filling top-open, side-open and end-open shipping cases. Extremely flexible—handles a wide range of products and packages.



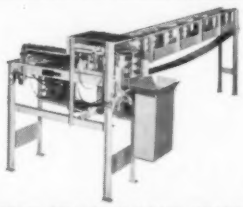
"SURE-WAY" FULLY-INTEGRATED CASING LINE

Composed of three completely synchronized automatic units: the "Sure-Way" Case Set-Up Machine, Package Caser and Case Sealer. Offers the ultimate in speed, efficiency and savings in operator manhours. Many other special accessories make this the most flexible unit in the field.



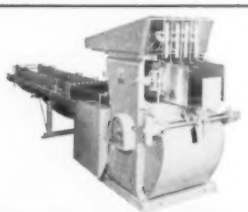
FMC NON-SHOCK END-OPEN CASER, MODEL 20

Specially designed to load single tier can patterns into economical end-open shipping cases. Permits fibre savings up to 15%. Loads up to 1200 cases an hour. Ideal for 46 oz., #10 and #12 cans.



FMC NON-SHOCK END-OPEN CASER, MODEL 10

An extremely well-constructed low priced machine, specially designed for single tier loading of cans into end-open shipping cases at relatively low or medium rates of production. Loads 10 cases a minute on #12 and #10 cans; 7 to 9 cases on 46 oz. and 307 diameter sizes. Has all the important "Non-Shock" features.



FMC NON-SHOCK TOP-OPEN CASER, MODEL 3

For continuous, high-speed lines loading single or multiple tiers into top open shipping cases. Empty case is placed over loading chute; balance of cycle is completely automatic at speeds up to 1200 cases per hour. Handles can sizes from 202 x 308 packed 6 x 8, to 603 x 700 packed 2 x 3.

FMC is one of the world's leading manufacturers of casing equipment. Illustrated here are but a few of the complete FMC lines, including the famous "Sure-Way" line of package casers and associated equipment, which is distributed exclusively by FMC. If your product is packaged in a can, box, carton, or other rigid or semi-rigid container, or if the product itself takes a rigid shape, chances are you can case it better for less with FMC precision-engineered equipment. Let your FMC representative work with you in the best solution to your specific casing problem.

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:

WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

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NOW easiest opening closure on earth!

. . . another advantage for 2 STRIP CASE SEALING

LUDLOW'S NEW NON-STAINING *Quick-Strip* REINFORCED SEALING TAPE

2-strip case sealing with Quick-Strip wins friends for your product because it offers important new packaging convenience. Ludlow's reinforced sealing tapes with new non-asphaltic Quick-Strip takes the mess, effort, and delay out of opening cartons — leaves no tar-like smears on knives, counters, clothes, products, or people, as ordinary reinforced tapes do. And it's the lowest-cost non-asphaltic tape on the market!

Quick-Strip is reinforced for tremendous strength, yet peels away readily when you want it to, leaving only a light kraft tissue that slits easily with the slightest touch. Give your cartons the sealing-power and opening-appeal of modern Quick-Strip.

Ludlow

GLASPUN-SNAKETAPE

LUDLOW PAPERS, Dept. PE91, Needham Heights 94, Mass.
A Division of Ludlow Corporation

Send me details and samples of
Ludlow non-asphaltic Quick-Strip reinforced tape.

Name _____

Firm _____

Address _____

City _____ State _____

The most extensive service on printed tapes in the industry, ranging up to seven colors.

WRAPPING MACHINES

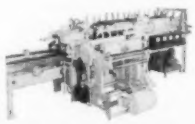
9

ONE OF THESE

Battle Creek model 475's will soft film overwrap your thin, rectangular or irregularly shaped products at high speed

Model for 475 General Rectangular Applications

Model 475-H for Soft Irregular Products



Model 475-SN for Square Soft Items

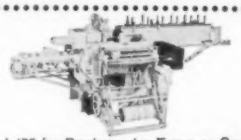
Model 475-S for Thin or Thick Items

Model 475-TS for Soft Rounded Shapes

Model 475-TT for Irregular Products

Model 475-N for Paper Napkin Overwrapping

Model 475-T for Textile Products



Model 475 for Rectangular Trays or Cartons

products like these can be beautifully packaged at speeds up to 75 per minute

These newly developed machines have been thoroughly field tested in more than 100 installations. All machines create attractive, weld-sealed packages in polyethylene and most of the currently available plastic films besides being adaptable to films of the future. Our engineering service will help you choose from nine different Model 475's the machine best suited to your particular packaging needs. Send your inquiry in today.

Continuous Flow PACKAGING

BATTLE CREEK *packaging machines, inc.*, BATTLE CREEK, MICH.

PMMI

BEMA

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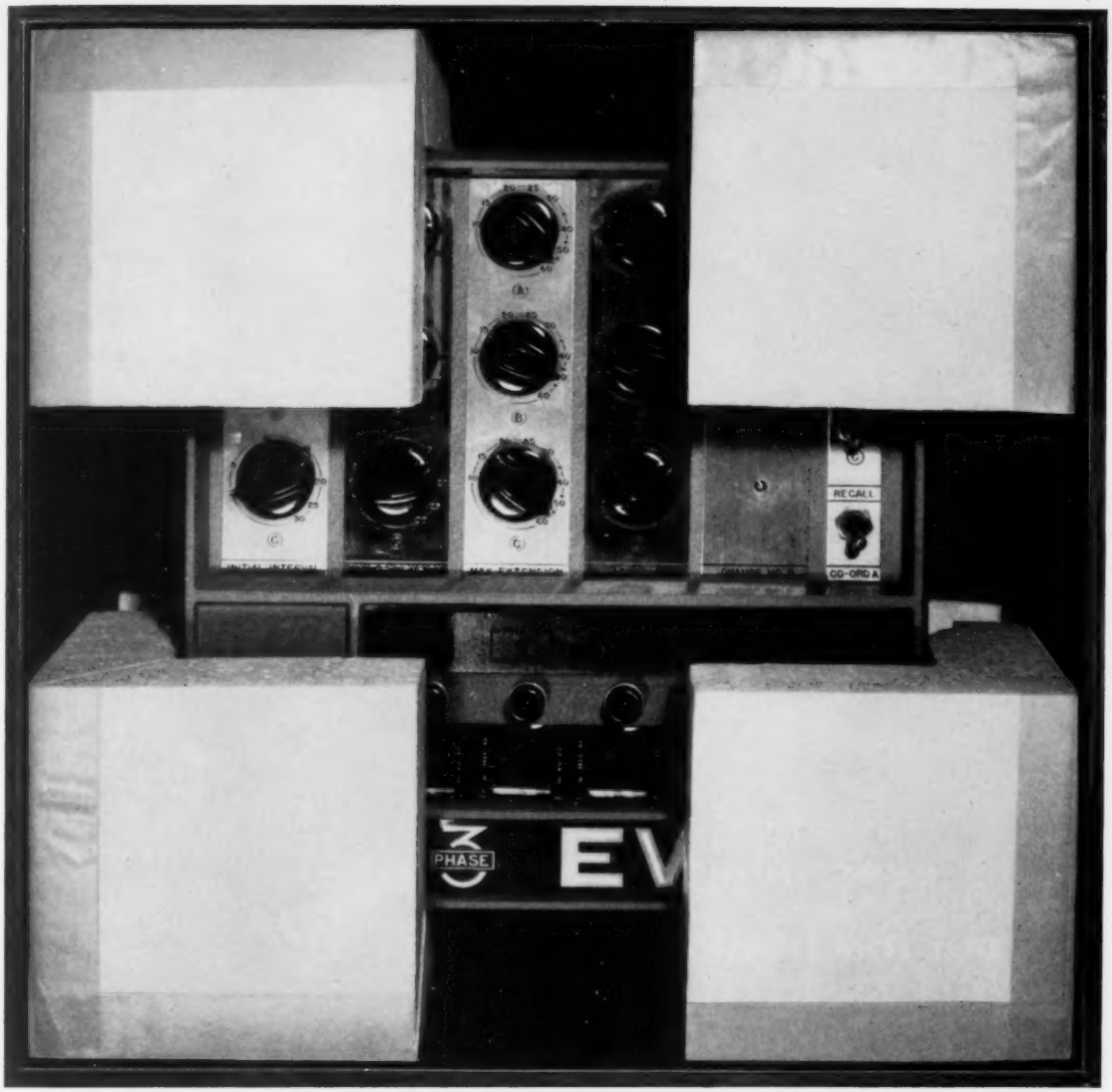


Resilo-Pak cuts weight 40%, cubage 50% for control unit package

This package, engineered with Armstrong Resilo-Pak, effectively cushions this traffic-signal control unit against shock and solves other packaging problems for the Eagle Signal Company, Moline, Illinois, by cutting storage space, shipping weight, and packing time.

The new package designed by W. K. Swift Associates, Inc., is half the size of the previous container, which required both an inner and outer carton and double cushioning with excelsior pads and shredded paper. The new package weighs 45 pounds, compared to the previous 70. And it cuts packing time by 25%.

Now, inside a single corrugated board carton, 2″ thick corner pads of Resilo-Pak safeguard the unit against shocks of 60 to 75 G's. A check of the first 100 units packaged with Resilo-Pak disclosed that protection was so excellent that no adjustment to correct effects of transportation was required on arrival.

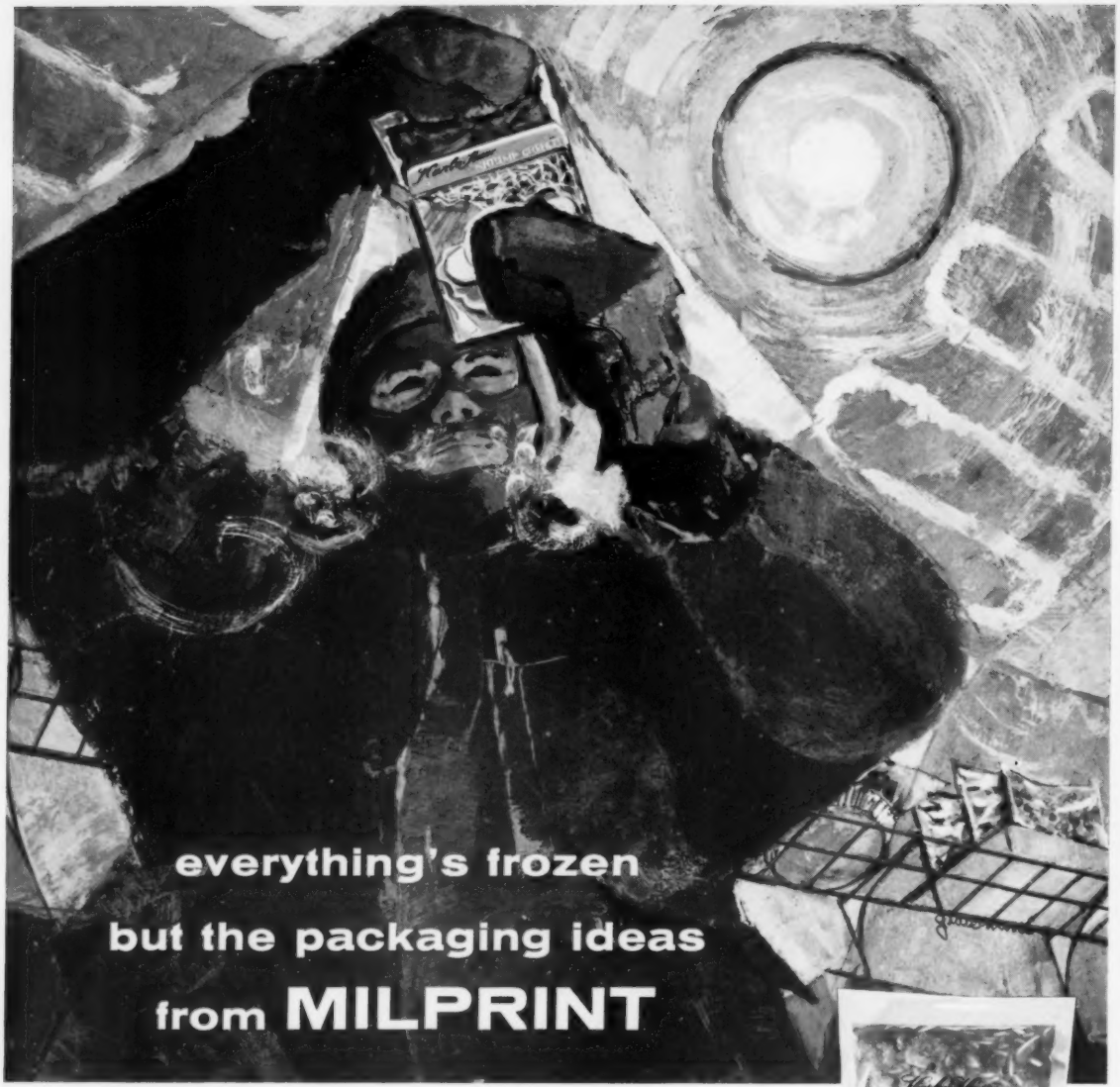
Clean, white Resilo-Pak is highly versatile. It can be fabricated by die-cutting, hot wire cutting, heat deformation, or cementing. It cushions effectively from −80°F. to +165°F. It is odorless, non-corrosive, non-dusting, and non-abrasive. And it meets Interim Fed. Spec. PPP-C-00850 (GSA-FSS).

For a free Resilo-Pak booklet, write Armstrong Cork Company, 3109 Pearl Street, Lancaster, Pennsylvania.

RESILO-PAK IS A TRADE-MARK OF ARMSTRONG CORK COMPANY

Armstrong RESILO-PAK

Developed Specially for the Engineered Package



Now...a boil-in-pouch that works! From Milprint's dynamic research comes the first completely successful pouch for the fast-growing boil-in package field: new KETTLE-REDI pouches by Milprint!

Kettle-Redi's superior lamination stands up under temperature extremes from boiling to 50° below without cracking or leaking . . . remains unaffected by any combination of thermal and chemical factors . . . resists scuffing and tearing . . . offers excellent machineability plus exclusive "locked in" reverse printing that defies age or handling — lifelike flexographic or rotogravure printing that stays better looking at the point of sale!

Call Milprint now for information on Kettle-Redi pouches for cook-in applications!

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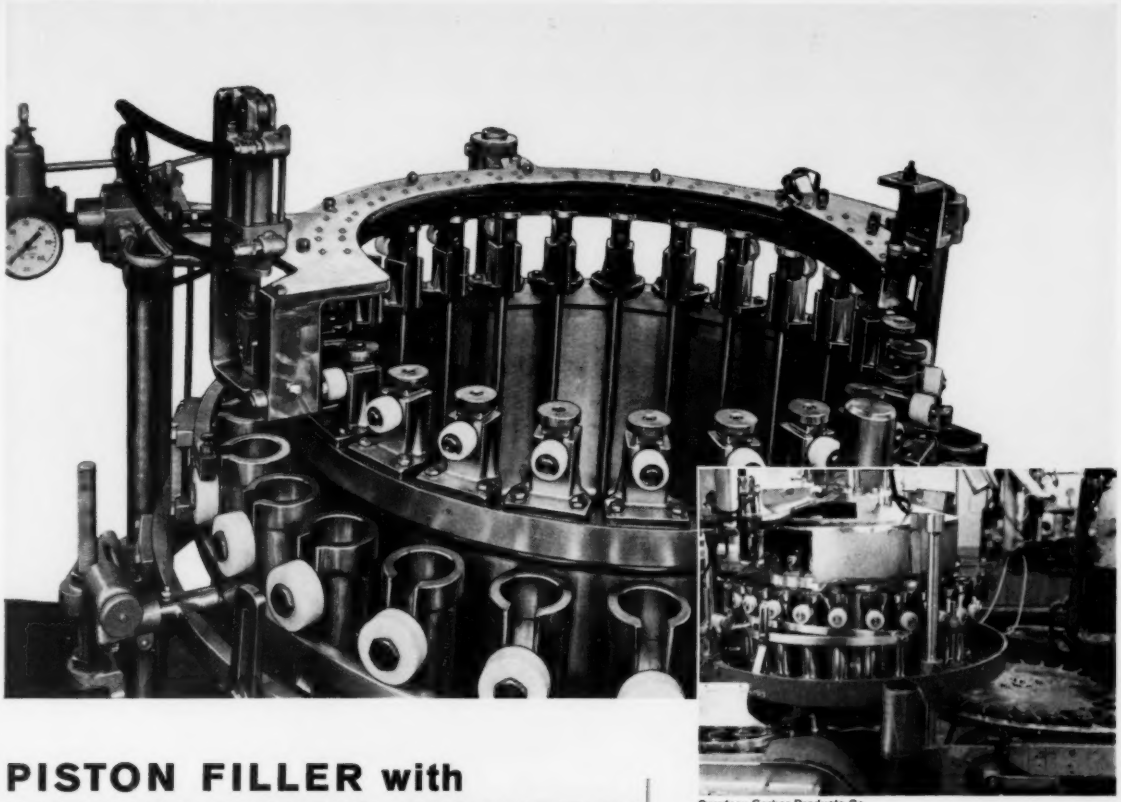

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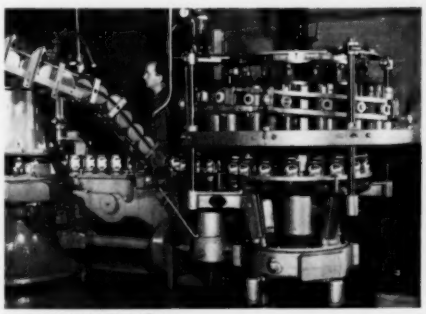

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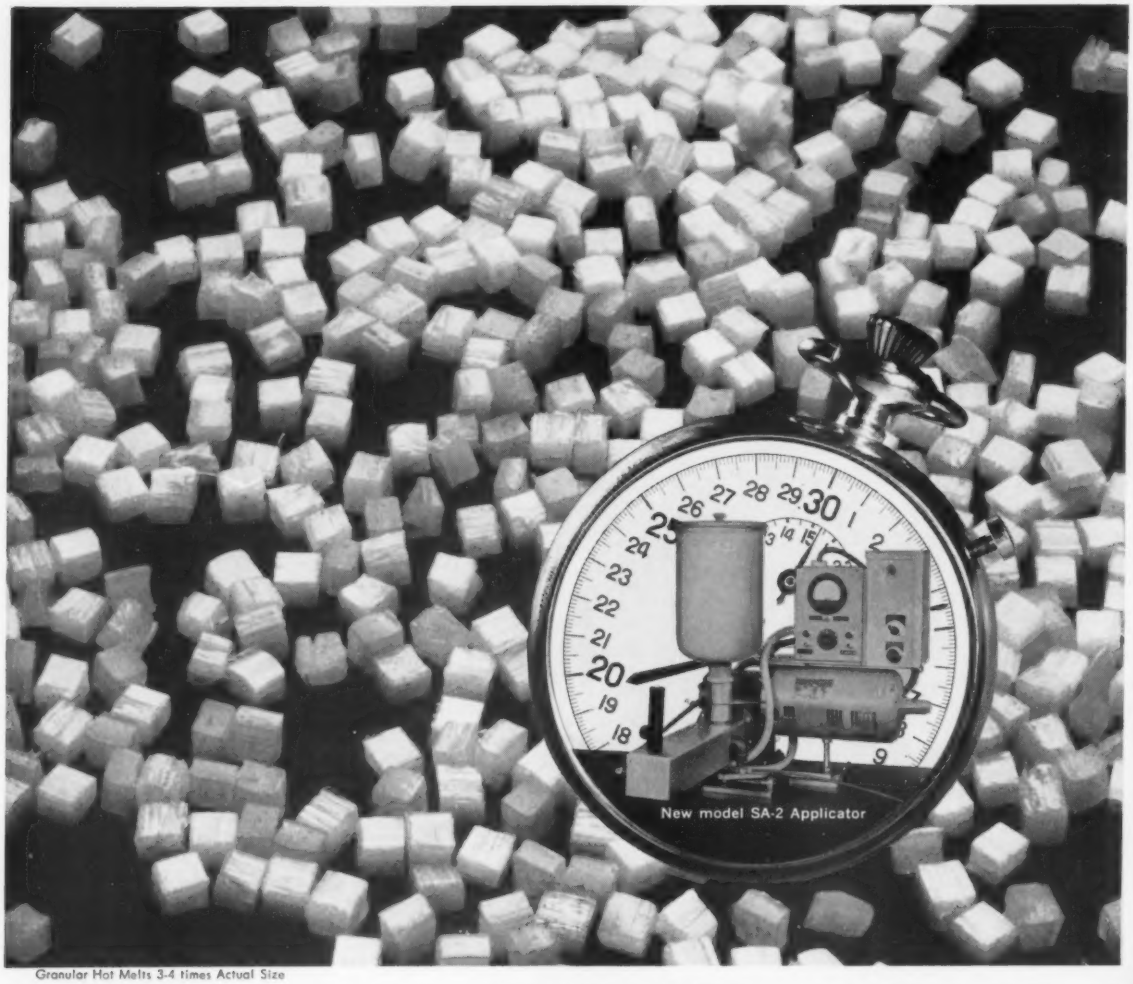

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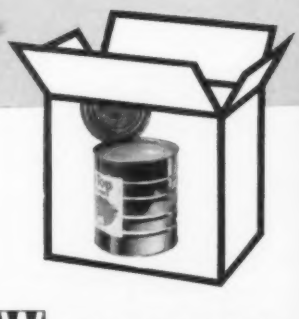

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Latest QM tests show end-opening RSC's cut board use up to 30 per cent and match top-opening RSC's in rough handling; diagonal loading has only "slight" edge on right-angle loading

Are you "up" on end-opening corrugated cases?

By Joseph P. Akrep, *Container Technologist*
George A. Amundsen and Anderson Miller, *Technologists*
Research & Methods Analysis Branch, Container Division
Quartermaster Food and Container Institute for the Armed Forces
Chicago

Any dollar-saving potential merits the attention of those concerned with packaging and/or packaging operations. This is particularly true in highly competitive industries such as the food industry because (1) the cost consciousness and competitive attitude prevailing provoke a continuous search for ways of cutting operating costs; and (2) many dollar-saving packaging innovations are directly attributable to the food industry's research efforts.

One such cost-cutting innovation rapidly gaining momentum is the use of end-opening (in place of top-opening) regular slotted corrugated containers (RSC's) for canned foods. Case packing machinery already in use for end packing No. 10, No. 3 cylinder, and 211x413 can sizes shows that this dollar-saving innovation is starting a new trend.

Diagonal loading of shipping cases—in lieu of the standard right-angle pattern—offers another cost cutting potential. For example, only about 78½ per cent of the space in a right-angle packed RSC containing canned food is occupied by the product. The remaining 21½ per cent is shipped as "wasted" space.

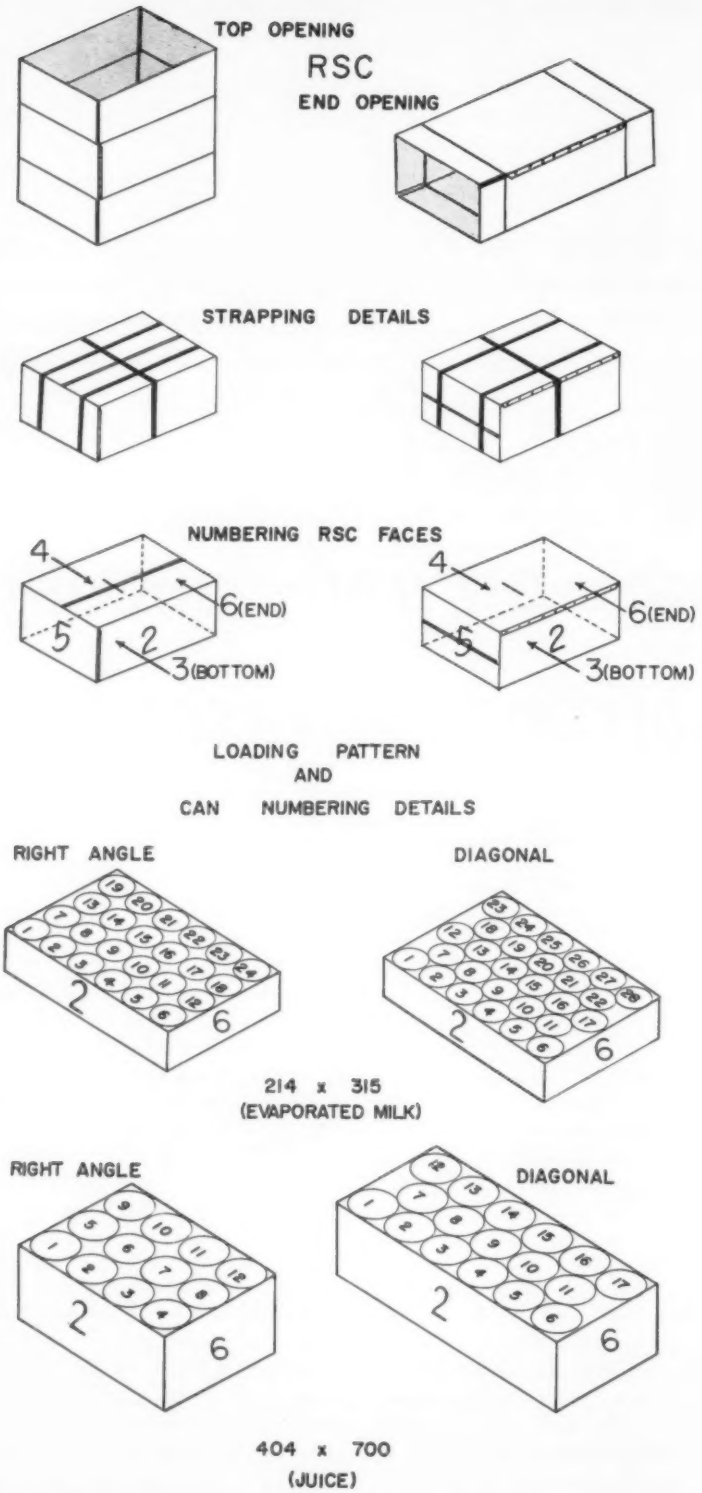
A recurring suggestion for eliminating this problem is to use square or rectangular cans. While this seems plausible at first glance, there are many disadvantages: higher costs, more steel required for cans of equivalent volume, slower manufacturing speeds, and inferior performance on-the-line, in transit, in storage, and in shipment. These outweigh the advantage of saving on shipping space.

Since the standard sanitary open top seems here to stay, using diagonal loading instead of the standard right-angle loading pattern offers an alternate solution to this wasted space problem.

Dollar Savings Possible

Results of a previous study showed that the end-opening style RSC saved up to 30 per cent in the amount of fibreboard required to enclose a specific volume* and that a diagonal packing pattern saved from 2.5 to 7.5 per cent in cubage over the standard right-angle packing pattern in the containers compared. Some substan-

*A general method for solving problems of finding the optimum set of package dimensions as well as minimum board area formulae for common corrugated boxes and cartons are presented in George G. Maltenfort's article "Optimum package dimensions save board," *Package Engineering* 6:6, June 1961; 6:7, July 1961.



1 **TEST VARIABLES** included: top-opening and end-opening RSC's of 200-lb.-test domestic fibreboard and V3c's of 350-lb.-test fibreboard (per PPP-B-636b), two can styles representing extremes in size and capacity, and two loading patterns—right angle and diagonal.

tiating data are given in Table I.

However, since actual data were not available on the relative performance characteristics of end-opening versus top-opening RSC's —using standard right-angle and diagonal loading patterns—a series of tests were designed specifically:

1. To determine rough handling performance characteristics of both end- and top-opening RSC's.

2. To evaluate the relative merits of standard right-angle and diagonal case-loading patterns.

If both the standard and alternate methods gave equivalent performance, then a substantial savings would be possible since the Department of Defense purchases millions of cases of canned subsistence annually.

Thus a secondary objective of the test was to determine whether actual laboratory test data could serve as a basis for effecting economies in the Quartermaster's huge task of supplying canned food to the Armed Forces.

This article reports the results of these investigations.

DETAILS OF TESTS

Fibreboard Containers

The containers used (as shown in Fig. 1) conformed to requirements of PPP-B-636b for RSC containers. Note that both the top-opening and end-opening cases fall under the RSC classification. The end-opening container is merely a tall version of the RSC. This necessitated a modification in the numbering of the container faces and a deviation from PPP-B-636b as regards strapping requirements for the export pack.

Details of the test packs (e.g., items packed, weights, container dimensions, type of opening, flap details, strapping, etc.) appear in Table II. The tests involved 16 sets of containers in the various combinations indicated (about 30 each) for a net total of 472 containers actually tested.

Strapping

With normal top-opening containers, PPP-B-636b calls for

lengthwise and girthwise straps. However, if the normal definition of the top being the opening face had been applied, it would have resulted in insufficient strapping. Therefore, strapping was placed on the end-opening containers just as if they were normal top-opening RSC's.

In addition, a standard Quartermaster modification was used because, by directive, all canned subsistence for export must be strapped with two lengthwise and one girthwise straps of the standard size. The strapping methods used are shown in Fig. 1.

Numbering Container Faces

Container faces in the top-opening containers were numbered according to ASTM-D-782-47 to insure consistent placement in the revolving drum test and consistent identification of container damage location. However, a major modification was necessary in the case of the end-opening cases since in RSC nomenclature the top of the box is always the face with the opening.

The ASTM numbering convention depends upon the proper orientation of the top of the box and the manufacturer's joint. For our purposes it was considered that the normal position of the cans was the overriding requirement since the stacking of the cases must be done with cans in normal attitude for compressive strength purposes. Therefore, end-opening container faces were marked just as if the box were a standard top-opening RSC, being careful only to select a consistent orientation for the manufacturer's joint and the actual opening.

The face numbering method used is illustrated in Fig. 1.

Coding Container Groups

A three-letter coding system was devised to facilitate recording of data and for convenient identification in tabulating or graphing the various combinations of board type, container style, and packing pattern.

JUICE	TOP OPEN	STANDARD	V3c	FAIL	FAIL LEAK	FAIL SPILL	FAIL JOINT	FAIL FLAP	FAIL STRAP

REVOLVING DRUM TEST

ITEM: Milk
CANS: 48
OPENING: End
PATTERN: Regular
FIBERBOARD: 200 lb.

73°F - 69% R.H. - 3rd

FAILS TO FIRST LEAKER
FAILS TO INCIPIENT SPILLAGE
TEST STOPPED FOR Spillage (25)

TIME: 2:40 P.M.
DATE: 9 Sept. 1959
PERSONNEL:
DRUM: Kanins
EVAL: Amundsen
DATA: Amundsen

TEARS AND CUTS	STAPLES PULLED	LEAKING CANS	MAJOR DEFECTS	MINOR DEFECTS	IRREGULARITIES
Tear-3-5-3"16 " 1-5-2"-(25) " 1-6-6"-(25)	7-face 6		T-4,7,12,19 22,23,24 B-	T-6,11,14,18 B-1,7,23,24	T-1,2,3,5,8,9,10,13 15,16,17,20,21 B-2,3,4,5,6,8,9,10,11 12,13,14,15,16,17,18,19 20,21,22,

2 SAMPLE DATA CARD. Each container had card for pertinent information and test results, and for easy sorting. Punched holes at top allow needle sorting by attributes.

The first letter of the code (D or V) identifies the type of fibreboard: D = domestic fibreboard, 200-lb.-test
V = V3c fibreboard, 350-lb.-test

The second letter (T or E) identifies the type of opening:
T = top opening
E = end opening

The third letter (R or D) identifies the packing pattern:
R = right-angle packing pattern
D = diagonal packing pattern

Metal Cans

For these experiments we selected two can sizes as being representative of large volume purchases by the Services:

404x700 (No. 3 cylinder) standard 46-oz. juice can
214x315 standard 14½-oz. evaporated milk can

These two can sizes not only represent extremes in size and capacity but are also representative of two can styles—the standard sanitary open-top can (with top and bottom end units double-seamed to can body) and the snap-end evaporated milk can (with soldered top and bottom end units).

A location convention chart with respect to box faces was set up to aid in permanently fixing the location of damaged cans. The can numbering method used is shown in Fig. 1. *(Turn page)*

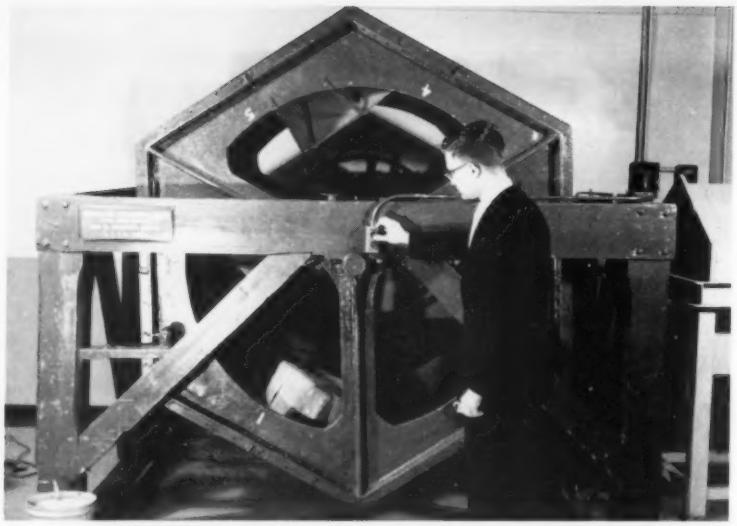
TABLE I

Container Board And Cube Savings Characteristics Of End- Vs. Top-Opening RSC's And Diagonal Vs. Standard Right-Angle Packing Patterns For Canned Items*

Can Size	RSC Dimensions (in.)	Approx. Board Required (sq. in.)		Board Saving Per RSC	
		Top Opening	End Opening	(sq. in.)	(%)
214 x 315	17-1/4 x 11-1/2 x 7-7/8	1114	973	141	12
211 x 413	16-1/8 x 10-3/4 x 9-5/8	1095	1049	46	4
404 x 700	17 x 12-3/4 x 7	1175	948	227	20
401 x 411	16-1/4 x 12-3/16 x 9-3/8	1227	1105	122	10
307 x 409	13-3/4 x 10-5/16 x 9-1/8	935	888	47	5

		Loading Pattern	Cans Per Case	Volume (cu. in.) RSC	Volume (cu. in.) Cans	Volume Used (%)	Cubage Saved (%)
214 x 315	17-1/4 x 11-1/2 x 7-7/8	R	48	1587	1227	77.3	—
214 x 315	20-1/8 x 7-7/8 x 7-7/8	D	40	1248	1022	81.9	4.6
214 x 315	20-1/8 x 7-7/8 x 11-13/16	D	60	1872	1534	81.9	4.6
214 x 315	17-1/4 x 12-7/8 x 7-7/8	D	56	1750	1431	81.9	4.6
214 x 315	17-1/4 x 12-7/8 x 11-13/16	D	84	2623	2147	81.9	4.6
404 x 700	17 x 12-3/4 x 7	R	12	1517	1192	78.57	—
404 x 700	25-1/2 x 11-5/8 x 7	D	17	2075	1688	81.35	2.78
404 x 700	29-3/4 x 11-5/8 x 7	D	20	2421	1986	82.03	3.46

*Technical Report, No. 193, Qm.FCIAF No. 3-59. "Design Study of Container Board and Cube Savings Characteristics of End-Opening Cartons and Diagonal Packing Patterns Versus Standard Methods of Pack for Canned Items."



3 **SEVEN-FOOT REVOLVING DRUM** used to determine rough handling characteristics of various packs. Drum seemed best though it has shortcomings with 25-in.-long containers.

Interior Packing

Typical loading patterns for cans used in the study also appear in Fig. 1. The 214x315 evaporated milk cans were placed in two layers using 24 cans/layer for right-angle loading and 28/layer for diagonal loading. Case loads of 48 cans for the right-angle pack and 56 cans for the diagonal pack weighed approximately 51 lb. and 60 lb. respectively.

The 404x700 juice cans were packed in a single layer: 12/layer for right-angle loading and 17/layer for diagonal loading, weighing 40 lb. and 57 lb. respectively.

Conditioning

All packs were conditioned according to ASTM D-685-44 for at least 48 hr. at the standard conditions of 73.4°F. ± 3.6° and 50 per cent R.H. ± 2 per cent.

Data Card System

Because of the large number of containers tested (472 of all types), we used a data card system (using one card per container tested) to allow easy sorting. It also allowed an array based on any given attribute. An added attraction for the card system was the possibility of setting up a "key sort" method of punched holes along one edge for needle sorting by attributes.

Fig. 2 shows a card designed along such lines to evaluate the utility of this test. The punched holes were identified for sorting by major classification of interest, including areas of failure.

The balance of the card contained blanks for recording information, including data taken at the time of the test on can damage, staples pulled, container tears and cuts, etc.

Revolving Drum

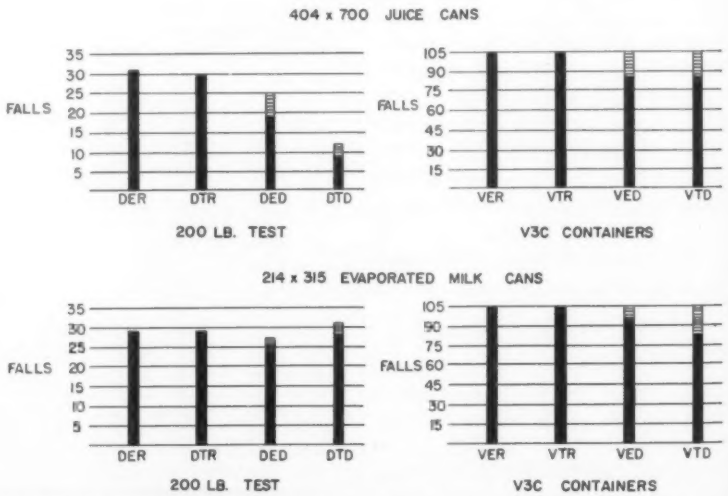
A 7-ft. revolving drum conforming to ASTM D-782-47 (except it did not have the conical projection for simulating a puncture hazard) was selected as the testing facility to determine rough handling characteristics of the various packs. (See Fig. 3.)

The drum seemed the best available test method even though there might be some shortcomings with the 25-in. long containers. In preliminary tests of sample packs, the 7-ft. drum gave a sufficient range of falls to provide a reasonable evaluation of results. This justified selecting it over other methods that would not have been as discriminating or selective.

For purposes of this test, 35 falls were considered adequate as the end point for domestic shipment and 105 falls were selected as the test end point to simulate current overseas shipment of canned subsistence to locations where good handling, storage, and warehousing conditions prevail.

Testing Method

As a statistical precaution against influence by any local variable, we tested 10 containers from each of the 16 groups successively, thus testing 160 containers before repeating the same test group.



4 **ACTUAL PERFORMANCE** of containers in drum test (solid bars) vs. projected performance with weight correction, based on limits of 35 falls for 200-lb.-test RSC's, 105 for V3c's.

The containers were removed one at a time from the conditioning room and tested in the 7-ft. revolving drum according to ASTM Test Procedure D-782-47. Each test consisted of continued falls until failure occurred or until reaching the predetermined limit of falls without failure—whichever came first. Either spillage of contents from the container or leakage of contents from the cans constituted failure.

The container identification, number of falls, damage experienced, and other information went on each data card at the end of each test. Special attention was taken in noting lengths of tears and cuts as well as the location and number of falls at which they occurred; number of staples pulled and location; and location and number of cans with leaks, major defects, minor defects, and irregularities classified according to the "Visual Inspection Gage Set Number 33, Standard Classification of Defects for Dented Cans."

Fig. 1 shows the location convention chart (with respect to box faces) set up to aid in permanently fixing the location of the damaged cans—determined upon opening of the RSC immediately after the test.

Joseph P. Akrep is a graduate of Stevens Institute of Technology with an M.S. degree in industrial engineering. He was a mechanical engineer in applications engineering with Worthington Corp. and an industrial engineer and packaging-preservation technologist with the U.S. Naval Supply Research and Development Facility, Bayonne, N.J. before joining the Institute.

George A. Amundsen is a graduate of Armour Institute of Technology (now Illinois Institute of Technology) with a B.S. degree in civil engineering. Before joining the Institute in 1955 he was with Chicago Mill and Lumber Co. for 20 years. For his last 12 years there he was a package designer in the designing and testing laboratory.

Anderson Miller is a graduate of Tougaloo College with a B.A. degree. Following his military service, he studied physics and chemistry at University of Chicago and was precision inspector of the quality control department of Ford Motor Co.'s aircraft engine division. He joined the Institute in 1955.

RESULTS

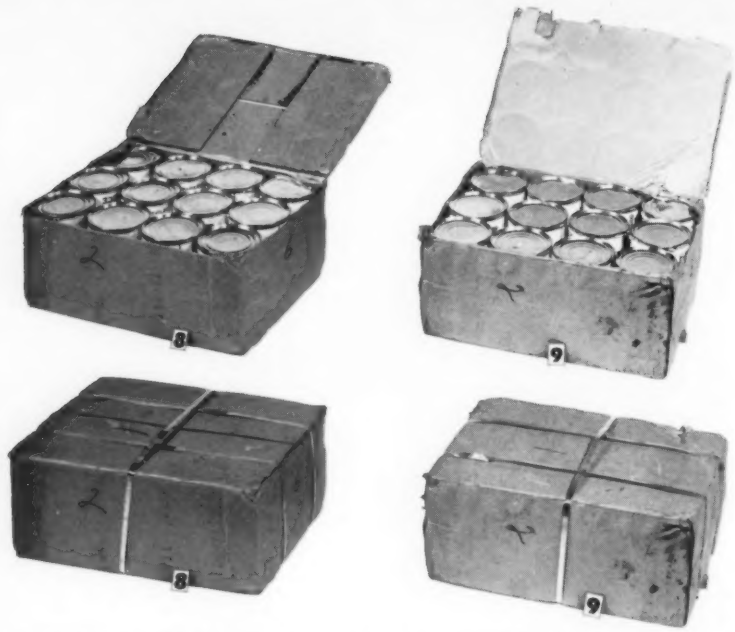
Table III summarizes the data on the cards tabulated for evaluation. The averages shown indicate the performance within each group as to the number of falls and the can damage resulting. For the purposes of analysis, the irregularities can be disregarded since they did not affect or disturb can contents.

In addition, the bar charts in Fig. 4 depict graphically the average performance of the different variables. Note that the chart shows the actual performance of the packs as tested and represents the actual data compiled on damage and number of falls in a

TABLE II
Details Of Test Packs

RSC Dimensions	Gross Weight (lb.)	No. Of Cans	Top Opening			End Opening		
			Code	Flaps	Strapping*	Code	Flaps	Strapping*
Evaporated Milk (214 x 315 cans)								
17-1/4 x 11-1/2 x 7-7/8	51	48	DTR	Top glued; bottom 20 staples	None	DER	1 end glued; 1 end 16 staples	None
17-1/4 x 11-1/2 x 7-7/8	51	48	VTR	Top glued; bottom 20 staples	2LW 1GW	VER	1 end glued; 1 end 16 staples	2LW 1GW
17-1/4 x 12-7/8 x 7-7/8	60	56	DTD	Top glued; bottom 24 staples	None	DED	1 end glued; 1 end 16 staples	None
17-1/4 x 12-7/8 x 7-7/8	60	56	VTD	Top glued; bottom 24 staples	2LW 1GW	VED	1 end glued; 1 end 16 staples	2LW 1GW
Tomato Juice (404 x 700 cans)								
17 x 12-3/4 x 7	40	12	DTR	Top glued; bottom 24 staples	None	DER	1 end glued; 1 end 16 staples	None
17 x 12-3/4 x 7	40	12	VTR	Top glued; bottom 24 staples	2LW 1GW	VER	1 end glued; 1 end 16 staples	2LW 1GW
25-1/2 x 11-5/8 x 7	57	17	DTD	Top glued; bottom 20 staples	None	DED	1 end glued; 1 end 16 staples	None
25-1/2 x 11-5/8 x 7	57	17	VTD	Top glued; bottom 20 staples	2LW 1GW	VED	1 end glued; 1 end 16 staples	2LW 1GW

*Strappings: 3/8 in. x 0.015 in. galvanized. LW = Lengthwise; GW = Girthwise.



5 DAMAGE from rough-handling revolving drum test occurred to corner cans (top). Export pack in V3c 350-lb.-test fibreboard (bottom) has special subsistence strapping pattern.

straight-forward comparison of pack versus pack.

Major Findings

Examination of the data in Table III and Fig. 4 reveals two major findings:

1. Over-all performance was about equal for the end-opening and top-opening RSC styles with one exception: in the domestic juice packs using a diagonal packing pattern, the end-opening container performed markedly better than the top-opening RSC.

2. The lighter weight standard right-angle packs performed better than the diagonal pattern packs in every case with differences most marked in the longer juice packs in domestic RSC containers.

The data also show less average staple pulling with the lighter weight domestic right-angle packs than with the heavier diagonal packs in all cases and that no strapping failures (spillage) occurred in any of the V3c containers.

Leaking cans occurred only in the export diagonal packs and were of the same magnitude for both top-opening and end-opening cases. The average number of irregularities was considerably higher in all evaporated milk packs (DTR, DER, DTD, DED, VTR, VER, VTD, and VED) than in comparable tomato juice packs.

Figs. 5 through 7 illustrate representative damage to the packs after test.

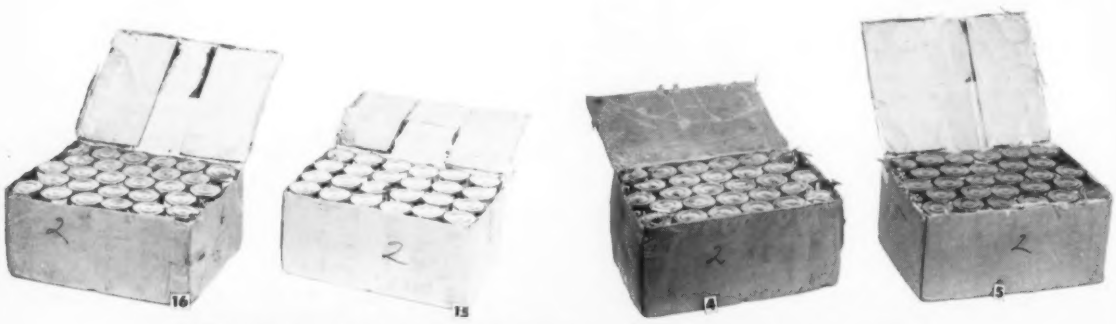
Weight And RSC Length Performance Factors

The fall-off in diagonal pack performance shown in Fig. 4 was expected, being attributed to the heavier weights of the diagonal packs as well as to the longer lengths of the shipping cases.

Pack weights of the diagonally loaded cases, as tabulated in the test procedures, exceeded the standard right-angle pack weight in every case: the 56-can milk packs being 15 per cent heavier and the 17-can juice packs being 30 per cent heavier.

The diagonal packs, therefore, approach the maximum allowable load limit of 65 lb. for 200-lb.-test domestic fibreboard specified in both Rule 41 (Uniform Freight Classification No. 4 and Consolidated Freight Classification No. 21) and in Specification PPP-B-636b.

However, lighter weight diagonal loading patterns are possible, such as a 14-can juice pack weighing 47 lb. This suggests improved performance. Or, a 40-can diagonally loaded milk pack (weighing 43 lb.) presumably would per-



6 DIAGONAL VS. STANDARD right-angle packing of evaporated milk cans in top-opening RSC's (left). Allowing for weight difference (60 vs. 51 lb.), packs gave approximately equivalent rough handling performance. Diagonal packs of evaporated milk in 200-lb.-test end-opening and top-opening RSC's (right) also gave about equal performance.

7 STAPLE PULLING AND TEARS in top- and end-opening domestic 200-lb.-test RSC's at left is typical. Export pack for 17 46-oz. juice cans (right) shows excessive crushing of corners. Long boxes got caught in baffles of drum and dropped as much as 4 ft.

form even better than the standard 48-can right-angle pack, while still saving board and cube.

Continuation of the solid bars illustrated in Fig. 4 shows performance proportionately adjusted to allow for weight differences.

The data show a correlation of domestic pack container length to the number of falls to failure. In the domestic evaporated milk packs, the RSC's for both diagonal and right-angle loading were of the same length—17¼ in. A slight tapering-off of performance—due to the greater weight of the diagonal packs—was expected and substantiated by the experimental data.

However, in the domestic juice packs, a 25½-in.-long RSC was used for diagonal loading as compared with 17 in. for the right-angle pack, complicating use of the 7-ft. revolving drum.

The longer containers frequently caught in the baffles of the drum and were carried up 3 to 4 ft. before dropping down vertically—often onto a baffle. No doubt this action caused greater damage than would have been experienced if normal tumbling and sliding had occurred.

The proportion of the diagonally loaded RSC was another factor contributing to damage. The length was more than twice the width, resulting in an excessive gap in the top-opening RSC's because of the short flaps.

TABLE III

Summary Of Data On Cards Tabulated For Evaluation

Code	RSC Size*	No. Of RSC's	Falls†	Staples Pulled†	Leaking Cans†	Defects† Major	Defects† Minor	Irregularities	Spillage	% Pack Over Limit
				EVAPORATED MILK						
DTR	1	8	35	3	—	4	5	37	No	27
		22	22	4	—	3	5.5	31	Yes	
DER	1	10	35	2	—	3	7	32	No	33
		20	24	5	—	5	6	22	Yes	
DTD	2	9	35	1	—	5	5	33	No	30
		21	20	9	—	5.5	5	30	Yes	
DED	2	3	35	6	—	9	5	27	No	11
		24	13	7	—	7	6	31	Yes	
VTR	1	30	105	—	—	7	9	32	No	100
VER	1	27	105	—	—	10	12	18	No	100
VTD	2	21	105	—	2	12	14	32	No	70
		9	70	—	2	13	13	29	No	
VED	2	12	105	2	1	20	13	23	No	41
		17	79	1	2	17	1	26	No	
				TOMATO JUICE						
DTR	3	19	35	—	—	2	2	7	No	63
		11	24	—	—	3	2	4	Yes	
DER	3	20	35	—	—	3	4	6	No	69
		9	26	—	—	2	3	6	Yes	
DTD	4	30	9	13	—	3	2	11	Yes	0
DED	4	30	19	1	—	5	3	8	Yes	0
VTR	3	30	105	—	—	5	3	5	No	100
VER	3	30	105	—	—	5	4	3	No	100
VTD	4	14	69	—	2	8	6	3	No	53
		16	105	—	1	9	6	2	No	
VED	4	6	105	—	2	10	4	3	No	20
		24	72	—	2	8	3	5	No	

*RSC sizes: (1) 17¼ x 11½ x 7⅞ in. (3) 17 x 12¾ x 7 in.
(2) 17¼ x 12⅞ x 7⅞ in. (4) 25½ x 11⅝ x 7 in.
†Average number.

CONCLUSIONS

End-opening RSC's performed equivalent to top-opening RSC's. This suggests taking advantage of the board area savings possible with the end-opening container. Diagonally loaded RSC's generally showed inferior performance to the right-angle loaded containers. However, the relatively good performance of the 56-can diagonal pack end-opening milk cases is particularly encouraging. Their use saves 4.6 per cent cube and 23 per cent in fibreboard. This amounts to about 5,490 sq. ft. of fibreboard per carload.

Since the government is a large purchaser of canned evaporated milk for domestic and overseas use, this presents an opportunity for substantial savings through the use of end-opening containers and/or diagonal loading patterns. *(End)*

1 DRAWBOARD FILLER is home-designed and -built. When one row of jars is filled, girl pushes row away from her—causing previously filled row to contact conveyor, which takes jars to cottoning.

2 USING TWEEZERS, girls place cotton puff into each miniature jar at rate of 1,500/hr. Cotton keeps tablets from chipping. Trays on either side of conveyor hold supply of cotton puffs.

Portable line packages "miniature" samples

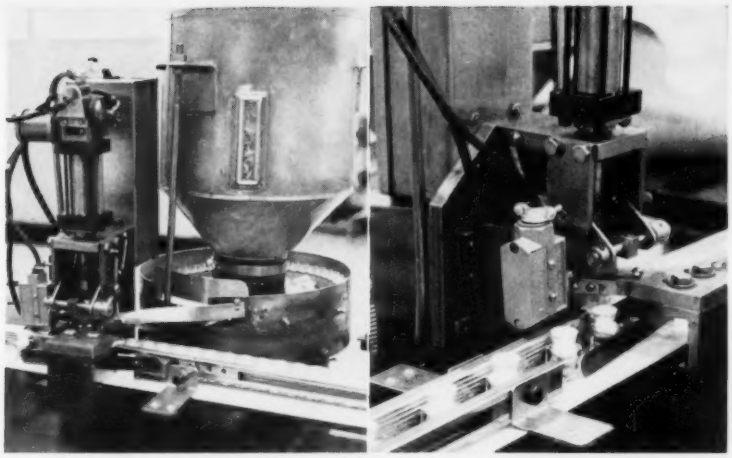
Recently, The Upjohn Co., Kalamazoo, Mich. pharmaceutical manufacturer, decided to use miniature apothecary jars for physicians' complimentary drug samples to maintain product-package identity when doctors pass the samples along to patients. Getting tiny (9/16x3/4 in.) labels glued onto these miniature jars (less than 1⅝ in. high) posed a packaging problem—particularly with a packaging line designed for 1⅞x1⅞x3⅝-in. jars and 1-3/8x2-7/16-in. labels.

Upjohn does not have enough volume in sample packaging to justify a fixed line just for that. Further, these tiny packages do not lend themselves to handling on regular production lines running at normal speeds. So the engineers devised a sample line the production people can assemble and set up anywhere in the plant. When temporarily through running samples, they simply take the line apart using components elsewhere. This (1) provides efficient sample packaging and (2) allows productive use of equipment for other things than sample packaging.

Solving this problem led Upjohn engineers to modify existing machinery, design and build some special gadgets such as a drawboard filler, and make other components mobile to permit integrating them with standard production-line equipment. The result: a portable-component packaging line to turn out samples on a production-line basis.

Upjohn executives explain that simply because of its small size the package requires unusual packaging techniques, especially for labeling. The low production volume does not justify automatic equipment so the engineers designed the line for running largely by hand.

Even so, they provide some



3 PLUGGING DEVICE (also home-designed and -built) automatically places flanged polyethylene friction-fit plugs into miniature jars at about 3,000/hr. Basic components: hopper, vibratory feeder, pneumatic ram. Plugs move from feeder along guide channel to plugger.

workable solutions to the problems of getting out small-quantity runs of sample packages at reasonable cost.

Line Layout

When sample packages are needed, workers assemble the portable labelers, conveyors, and other line equipment in the packaging area, thus forming a line. Upjohn's machine shops built the conveyors on casters and jack-screws for easy moving and rapid leveling. The labeler is also on jack screws to permit adjusting its height to that of the rest of the line.

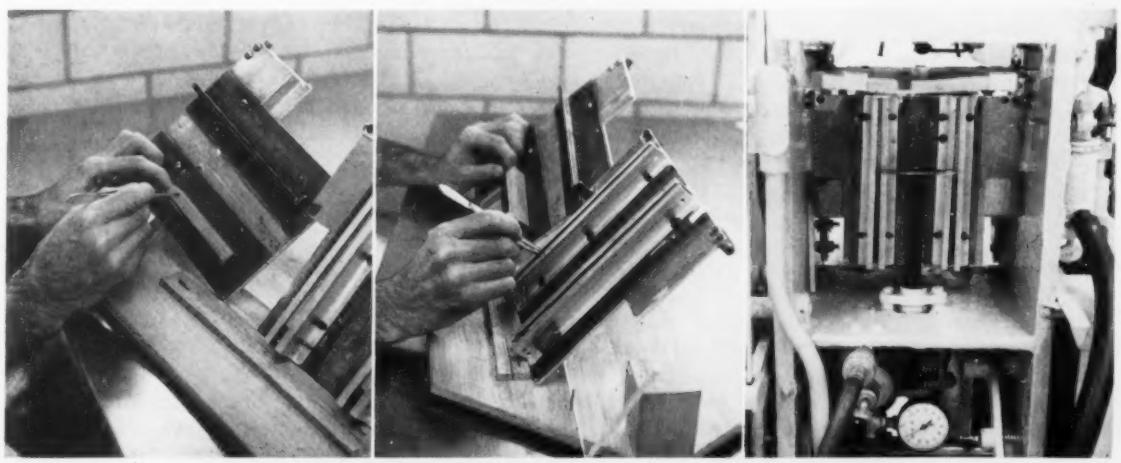
Usually eight girls and one man run the compact line which plugs jars automatically and labels semi-automatically. The other operations are manual. The man acts as roving supplier-attendant on the line, keeping supplies flowing to the various stations—such as delivering jars, feeding labels, etc.

Starts At Drawboard

Jars are hand-trucked to the line on corrugated board trays which have polyethylene covers to keep jars clean before filling.

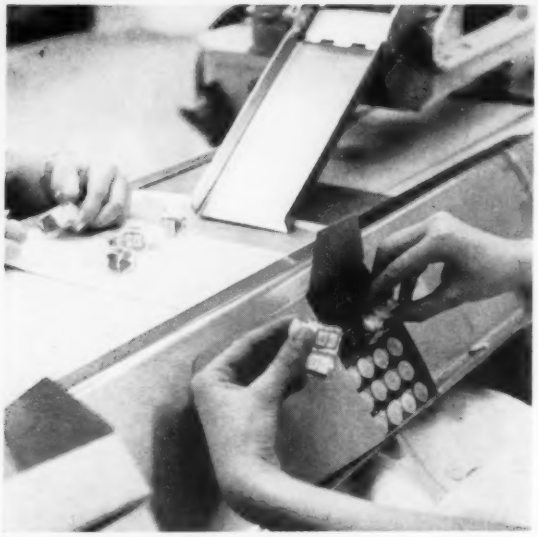
The operator transfers the entire tray of 18 doz. bottles to the ¼-in.-thick Plexiglas drawboard filler. Upjohn's carpenter shop constructed this filler to its own engineering design and specifications. One girl, hand-operating the filler (see Fig. 1), puts 4, 6, or 12 capsules or tablets (depending on size) into each of 12 bottles in a single draw—filling about 3,000 bottles/hr.

Filled bottles in groups of 12 move off the back of the drawboard filler onto a powered conveyor. As the filled bottles move along between guide rails, two girls (one on either side of the line) use tweezers to put a small



4 MINIATURE LABELS require special handling. Supply man picks about 100 labels from rack with tweezers (left), puts labels in magazine (center), which fits on back of labeling machine (right). Metal fingers on rack and pinion raise labels to labeling heads as needed.

5 LABELER OPERATOR picks up two bottles from chute (foreground), places them on holders (arrows) to receive labels. Air blasts (from pipes behind bottles) ease bottles onto conveyor.



6 FILLED AND LABELED bottles drop down chute. Girls inspect for straight labels and tight plugs, then hand pack them in 24-unit chipboard cartons. Partitions protect labels from scuffing.

cotton puff into each bottle to keep tablets from chipping during subsequent handling. Stainless steel trays on each side of the line hold a supply of cotton puffs. (See Fig. 2.)

Upjohn Has Own Plugger

Getting the friction-fit polyethylene plug into the bottle economically represents the joint effort of the packaging engineers who developed the specifications and the mechanical engineers who designed and built the automatic plugger to do the job.

As illustrated in Fig. 3, a plug hopper, Syntron vibratory feeder, and pneumatic ram comprise the main components of this unit. Each 0.520-in.-diameter flanged plug moves from the vibratory feeder along a guide channel to the plugger. As the bottles come into position a vertically-mounted pneumatic ram pushes the plug down into the bottle neck.

As the bottle moves under the plugging equipment, a bar in the guide rail brings it into position and stops it. The conveyor belt keeps moving, but the whole line of bottles stops. The bottle trips the trip-wire-operated Micro Switch.

This starts the downward ram stroke of the automatic plugging cycle. As the ram moves down, a cone-shaped collar around the ram shaft trips a second Micro Switch to reverse the stroke at the instant the plug goes into the bottle.

On the upward stroke of the ram, the collar moves a rocker arm and "finger," pushing the plugged bottle free of the stop and letting it move along the conveyor. Approximately 3,000 jars/hr. are plugged. However, the speed of the plugging cycle is hand adjustable so it can be speeded up or slowed down to keep pace with the rest of the line.

Air pressure to operate the ram is valved down to 50 lb./sq. in. from the 100 lb./sq. in. carried in the plant air line.

Bottles Move To Labeler

Plugged bottles move automatically from the plugger (on a powered conveyor between guide rails) to the trough-like infeed of the semiautomatic labeling unit. The 1x⅞-in. stainless steel channel rests on a slight incline. Bottles coming off the conveyor push the bottles ahead of them into and up the trough. This brings them within easy reach of the labeler operator.

The operator picks up a bottle in each hand and puts each on its side into shallow channel-shaped guides under the heads of a New Jersey labeler. The bottom of the bottle rests against a bracket stop across the back of the guide. This properly indexes the bottles for labeling.

Holder Helps Labeling

Getting the small labels onto the bottles gave Upjohn's engineers the most trouble. A 9/16x 3/4-in. label goes on bottles needing only one label; bottles needing two get 9/16x17/32-in. labels on opposite face panels. Labels as small as these do not stack properly on a conventional labeler magazine such as that used for Upjohn's standard-size labels (1-3/8x 2-7/16 in.), so a special one is necessary. Upjohn's engineers built and designed one to do the job.

To feed the labels fast enough to keep pace with the rest of the line, they also developed a holder which lines up the small labels, keeping them in stacks for fast feeding to the labeler magazine.

The same man who supplies capsules, tablets, bottles, plugs, etc. to the line hand loads labels into the magazine. He first re-

moves a kraft paper band from a stack of approximately 500 labels and places them on edge in a horizontal holder made of ⅛-in. steel plate. Using small tweezers, he picks up about 100 labels at a time, transferring them to the labeler magazine, as shown in Fig. 4.

The magazine has two sets of label guides to hold labels in place. A slot runs the length of each label guide and facilitates placing a tweezer-held stack of labels into the magazine.

After the line supply man loads the magazine with labels, he mounts it on the back of the labeler (see Fig. 4). Metal fingers attached to a rack-and-pinion go under the stack of labels in each slot and push them upward to the label pick-up heads as needed.

Air Ejects Bottles

After bottles receive labels, the upward movement of the labeling heads triggers the bottle release mechanism: a short blast of air from 3/16-in. copper tubing mounted behind the bottom of the bottle, as shown in Fig. 5. This air blast eases the bottles off the holders and back onto the conveyor belt.

This way the labeled bottles move out of the way automatically, leaving the operator free to reach to her right for two more bottles to insert in the holders immediately after they become empty. This operation is much faster than taking labeled bottles out of the labeler by hand and then replacing them with unlabeled bottles.

Each bottle, now on its side, moves along to either a second labeling machine (for bottles needing two labels) or to the inspection-packing station.

Inspect While Packing

A power conveyor carries the bottles away from the labeler to a chute emptying onto a card-covered portable conveyor—the inspection-packing station. Here two girls pick up two bottles at a time in each hand, inspect bottles for straight labels, tight plugs, and no evident defects. They then place bottles passing this visual inspection in a partitioned tuck-top carton of 0.018-in. manila-lined chipboard—24 bottles to each carton, as shown in Fig. 6.

Casing Of Cartons

Girls close the filled cartons and place them back on the conveyor which carries them to the casing operator. She hand packs six cartons in each 200-lb.-test A-flute corrugated shipper. This girl also sets up the tab-lock tuck-top cartons, puts in the preassembled partitions and feeds the cartons to the inspector-packers. The roving line supplier uses an Acme stitcher mounted on casters to set up the shippers "on-the-spot" for the caser.

The casing operator hand-seals the shippers with gummed tape and applies a label to identify the contents. Sealed cases go on a pallet adjacent to the sealing station and subsequently move by hand truck to the storage area.

Line Is Portable

All equipment used in this line is portable—mounted either on casters or jack screws. It is set up in a convenient spot anywhere in the plant and adjusted to height to integrate the components with other equipment in the line.

When not being used for packaging samples, the components are used in other parts of the plant, with the exception of the drawboard filler, which has a single purpose: filling miniature jars.

Thus Upjohn crews can assemble the equipment whenever necessary to get out small volumes of samples. The arrangement is flexible and lends itself to space available to get a particular job done. Personnel operating the line are similarly flexible in their abilities, changing stations frequently during a sample run. They do this (1) to help prevent operator fatigue and (2) to assure a full complement to run the line whenever necessary. *(End)*

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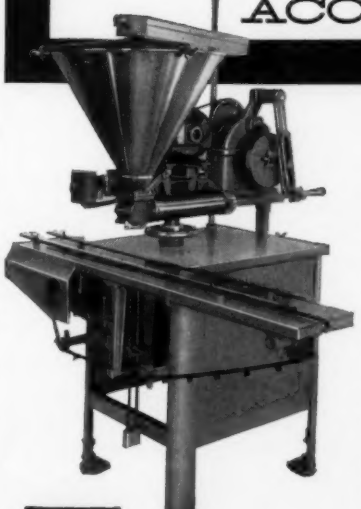

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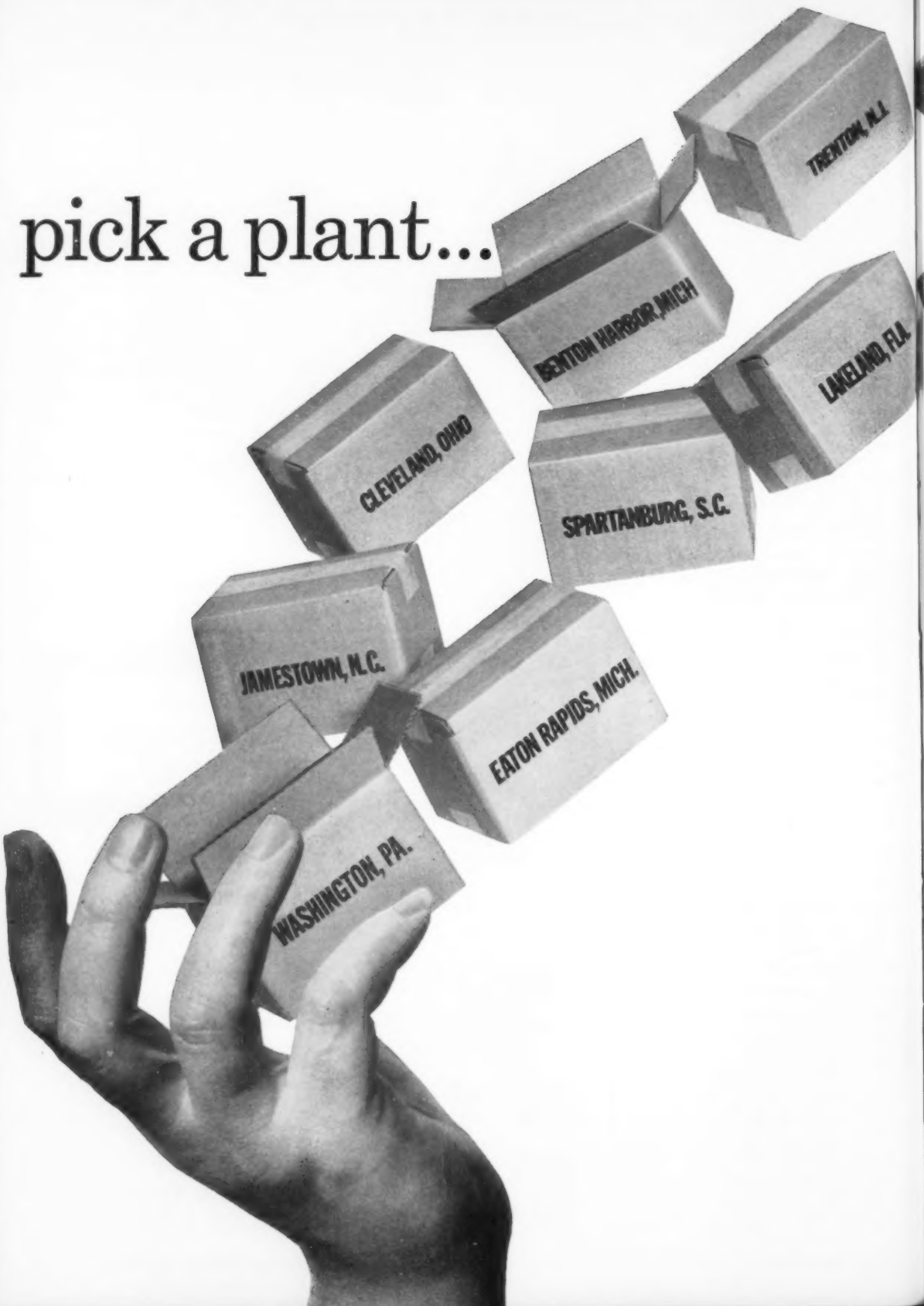
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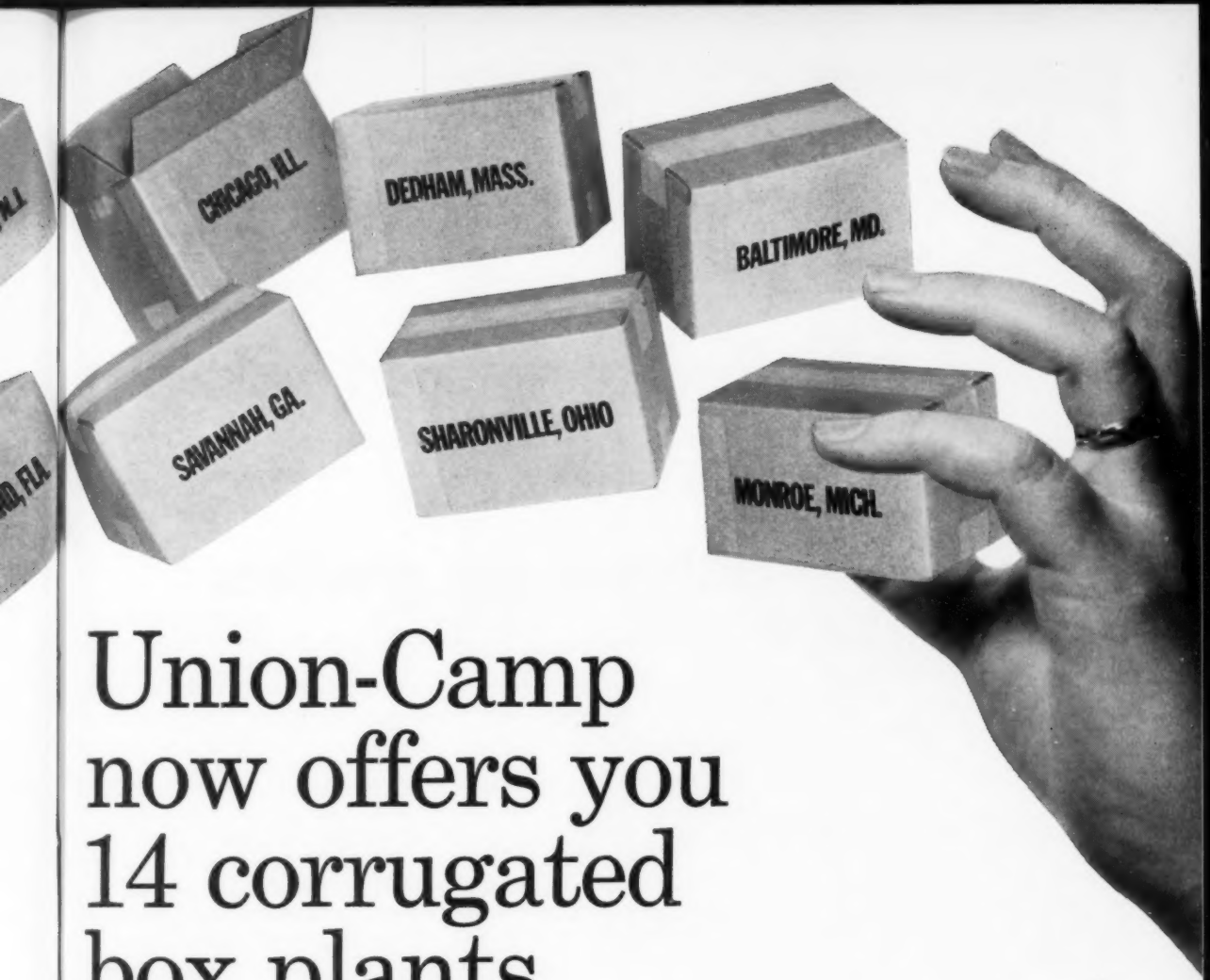

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Replacement part packaging must fit customer use practices

By A. T. Miller
Vice President of Operations
Badger Meter Manufacturing Company
Milwaukee

New package forms and packaging machinery innovations do not help you unless they also meet the needs and practices of your customers. We learned this about packaging service parts for water meters. Some time ago we started using skin packaging instead of cloth bags with drawstrings and attached mailing labels. Now we use four sizes of unsealed polyethylene bags instead of skin packages.

Water meters, which we sell to municipal water departments and private water companies, make up a large part of our product line. The departments and companies buying these meters range from the smallest to the largest. Similarly their storage and use of our spare and replacement parts range from one extreme to another.

Have Standard Packages

We studied the sale and distribution of parts over a period of several years in an effort to develop standard quantities for packages of parts. About the time we were reaching some tentative conclusions on such quantities, the possibilities of thermoformed skin packaging caught our eye. It appeared that skin packaging of parts would let us sell them in standard quantities and that the inherent visibility of these packages would help our customers to inventory and control the parts.

Just as we studied parts sales to arrive at standard packaging quantities, we regularly study field reports from our sales force. In efforts to make our packaging responsive to customer needs of storage, unpackaging, and use-out, we scrutinized customer practices in storing and using parts. This showed us that thermoformed skin packages containing standard quantities did not meet the needs of most water departments.

Know Storage Methods

Replacement part buying is contraseasonal. Water departments are busy installing meters during warm weather months but spend the winter and other bad weather months doing their "inside" work: repairing meters. Part buying goes in

Noting that he and his associates once thought that skin packages (to replace cloth bags) coupled with "standard" quantities of replacement parts were just what they needed, Mr. Miller points out that customer use-out methods dictated something else. His observations on using unsealed polyethylene bags for ease of inplant inspection and customer use-out stress the importance of keeping abreast of customer storage practices if you want these customers to keep on purchasing and using your products.

cycles to meet this work pattern, and many water departments have long-interval storage practices. Nearly all of them have their own particular methods of using bins, drawers, and the like to store parts.

We thought the water department people would hang our skin packaged parts on hooks for easy viewing and checking. Instead they were tearing open the packages and dumping the contents into their own storage receptacles. Also they were not buying in standard quantities.

No Standard Quantities

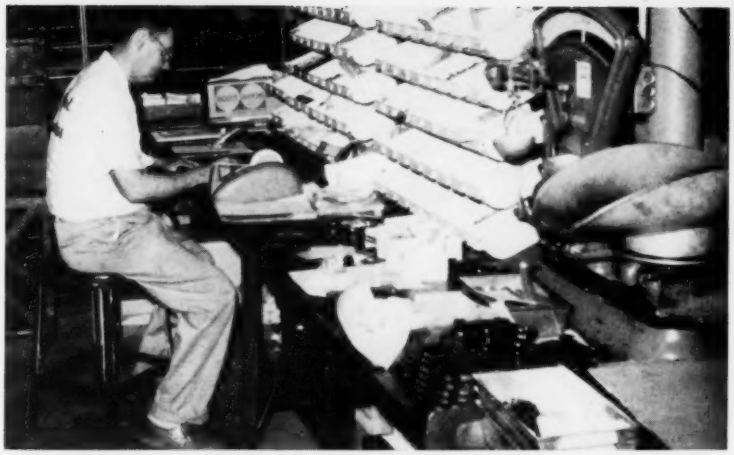
For example, in ordering a part which we packaged in quantities of 100, a typical water department might order 110. This meant our packaging crews had to tear open a standard package of 100 items. This created problems in handling the 10 to go and the remaining 90 to keep. Similar difficulties plagued the water departments.

To overcome these difficulties we now package our smaller spare and replacement parts in four sizes of printed 0.002-in. polyethylene bags. To permit easy opening and reclosing we secure each bag with pressure-sensitive tape instead of sealing the bags. There is a printed blank area on each bag on which our packaging crew members write identifying information.

"Skin" Versus Bags

An analysis of our total material and labor costs indicated that the use of polyethylene bags reduced our labor cost slightly and our material cost rather significantly.

Furthermore, our operation is not conducive to capitalizing on the advantages of machine packaging. After switching from cloth bags to skin packaging we found we simply could not run our skin packaging machine enough hours a day to make it economically feasible. Our average packaging cost per piece was higher when we used skin packaging, and having to ship some parts in quantities other than a standard package prevented an



PARTS PACKAGING OPERATION has three work stations along bench. Packaging is "to order," but pickers (such as man here) keep bins full of frequently used items, e.g., washers.

AFTER DRAWING PARTS for specific order, picker fills bag, closes it with rubber band to ease reopening for inspection. "Orders shipped per day" measure packaging productivity.

PRINTED WHITE AREA on each bag permits writing identifying data, thus avoids separate labels. Customers not dumping parts into bins use same bags for storage and use-out of parts.

INSPECTOR OPENS BAGS by removing rubber band, then inspects parts—checking them against drawings or by taking actual measurements. He recloses bags with pressure-sensitive tape.

AFTER INSPECTION orders move in tote trays by conveyor to final packaging point (upper left). Packers use corrugated boxes, die-cut inserts, excelsior to prepare orders for shipment.

efficient skin packaging operation.

Our current practice is to package replacement parts only to order. This is necessary because of random quantities ordered by customers and is made feasible by the ease of packaging when using the polyethylene bags. The inventory of parts is stocked in bins and on shelves and is maintained according to our perpetual inventory program.

This has involved establishing a protective stock quantity which is sealed in a plastic bag with a reorder form inside. This protective stock quantity is placed right in the bin or on the shelf with the rest of the items. When the consumption of parts exhausts the normal supply, the protective stock bag is broken and the reorder form processed through production control for the replacement of this stock.

Maintenance of a perpetual inventory along with the ease of packaging has helped us achieve our current standard of shipping the average parts order within four working days of its receipt. The addition of low volume parts, formerly treated as "specials," to our perpetual inventory program will permit us to reduce the shipping time to two days or less for an average parts order.

Setting Standards

We measure the productivity of our packaging crew in terms of orders shipped per day. In spite of the wide range of parts handled and order quantity variations, we have found that on an average we can apply an "orders-per-day" standard. In addition we are very selective in assigning people to the parts packaging areas.

Our methods engineering people developed a physical layout and working techniques planned specifically for packaging parts in polyethylene bags. This operation fits right into our inspection station and packaging-for-shipment line.

Crews Fill Bags

We set up our packing stations along a bench near rows of bins holding replacement parts. The three pickers (who fill the bags) take individual orders and then draw from the bins the parts these orders require. They then take the components of these orders and put them in bags at the packaging stations. At each station there are rows of bins holding supplies of most commonly called for parts, such as screws and washers. Each bin carries the identifying number of the part it contains.

In addition the pickers do some assembling of larger parts and meter components at these stations. Also, they draw from stock and send along with the order any parts not lending themselves to bag packaging. Just as size, weight, and surface configurations prevented some parts from going into thermo-

Alexis T. Miller is a graduate of University of Chicago with an M.B.A. degree. He was with Studebaker-Packard Corp. seven years. His work there included office methods and engineering studies. He later was manager of the aircraft engineering cost department. Mr. Miller joined Badger Meter in 1955.

formed packages, some cannot go into polyethylene bags.

Some orders call for parts in quantities too large for individual counting, and crew members use Toledo scales to determine quantities by weight; for example, an order for 5,000 washers. Whether counted manually or by weight, these parts go into bags. Then the picker closes each bag with a rubber band.

Inspect Parts Closely

He does this because an inspector checks every outgoing order. Some parts are sufficiently critical to warrant checking against a drawing and by taking actual measurements. Others need only spot checking. But all orders pass the inspector's station before going down the line for final packing.

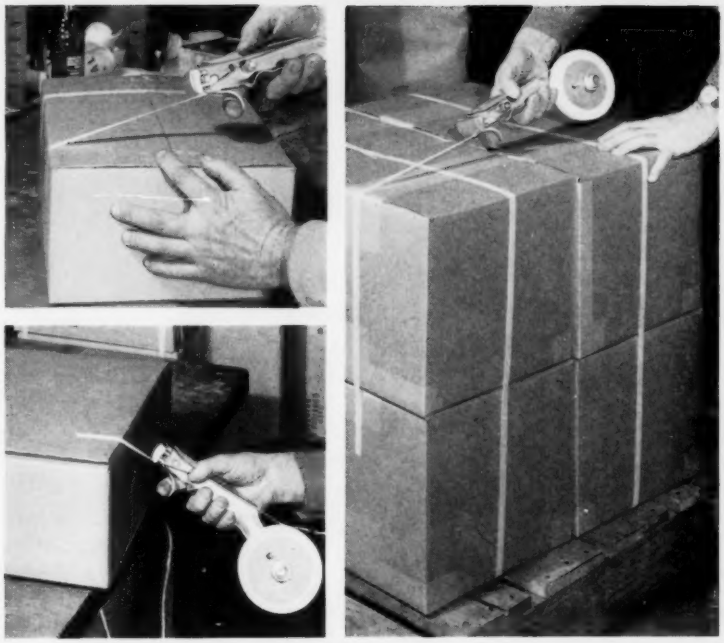
The arrangement of conveyors within the packaging area makes it easy for pickers to put completed orders in fibre tote trays on the conveyor. The inspector removes outgoing orders from the conveyor, and after checking the contents he closes the bags with pressure-sensitive tape and returns them to the conveyor.

Neither the crew member nor the inspector seals the bag. This means that the water department receiving it does not have to tear a sealed bag to get its contents and can use the bag itself for storage.

Completing Packages

After inspection and taping, outgoing parts move through a typical packaging operation where packers use corrugated boxes, die-cut inserts, excelsior, and other standard components to package parts for shipment. They secure boxes with tape before releasing them.

The new polyethylene bags provide usable packaging which meets our customer storage, unpackaging, and use-out needs. Intrigued as we were with the possibilities offered by skin packaging and much as we wanted standard quantities, we feel it more important to adjust our packaging methods to user convenience. *(End)*



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Odor problems elude easy solution

But knowing how to spot their sources, minimize their effects, and evolve tests that measure their contamination leads you toward some answers

By Roger W. Martyn
Research Manager
Mardon, Son & Hall, Ltd.
Bristol, England

The primary requirement of any package is complete protection of its contents. The amount of protection required varies with the degree of quality impairment a product can tolerate. Some products require only slight protection. Others such as foods and perfumed toilet goods have very exacting requirements. Preventing odor impairment is one of the most critical problems you encounter in packaging these products. Therefore, you must make every effort to protect them against original odor modification by any chemical, catalytic, or synergistic action, if you want to avoid odor complaints.

To do this you must be acquainted with potential sources of odor impairment.

SOURCES OF ODOR

Finding the source of odor contamination is your first major step toward eliminating or minimizing the problem. But you will find that this may not always be as easy as it sounds.

Potential sources of odor contamination include (1) the package and its various components; (2) the nature of the product; (3) interrelation of package to product; and (4) external sources such as those encountered during warehousing or distribution.

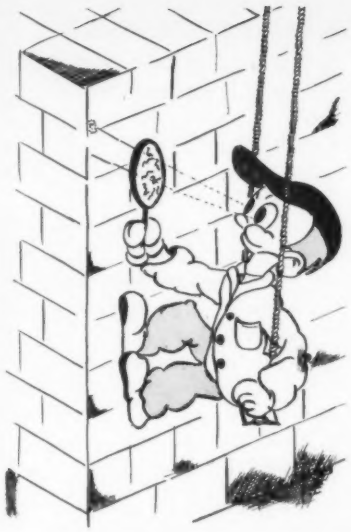
The Package

You can conveniently divide the package (as a source of contamination) into its components: packaging materials, printing inks, and adhesives. Most containers use at least two of these in combination.

Packaging materials. These include (1) paper and board; (2) films; (3) rigid plastics; (4) foil and sheet metal; and (5) glass. I should be sticking my neck out to no purpose if I said that these have been placed in descending order of their proneness to produce odor in unfavorable conditions. But it can certainly be said that the last two materials, metal and glass, are most unlikely sources of odor problems.

This doesn't mean that if you

Important in solving any odor problem is correct identification of the offending substance. Finding the source of contamination is the first step toward eliminating or minimizing the problem. However, doing this often takes concerted effort. Identifying the source does not necessarily mean knowing the underlying cause. Mr. Martyn reviews the potential sources of odor contamination and outlines some ways to minimize odor effects. He discusses the influence of machinery on odor problems and offers helpful techniques for testing for odor contamination.



FINDING SOURCE OF ODOR STARTS YOU TOWARD YOUR PROBLEM'S SOLUTION

incorrectly use these materials with, for example, a foodstuff requiring ventilation it won't lead to off-flavors and off-odors in the product. It might, but you should not blame the barrier materials.

On the other hand, you can find instances where metal cans or glass closures have been the direct cause of off-odor complaints. For example, the internal organic protective coatings used on cans or closures may pick up odors from the atmosphere during storage or on the line prior to filling. Insecticides used indiscriminately and can storage immediately adjacent to odorous materials have been responsible for more than a few complaints.

Odor Always A Possibility

You may even find instances where correctly chosen materials give trouble. For example, some time ago a product which had been packaged in foil for many years without an odor problem or complaint suddenly brought a spate of complaints. They were finally traced to a change in the oil used to lubricate the foil as it passed through the final stages of rolling down to correct thickness. Subsequent heat treatment (such as for soft temper foil) had not removed this oil, and a volatile constituent of the oil—or quite possibly a degradation product—had contaminated the contents of the package. This shows that you can't be too careful when guarding against the possibility of off-odors.

Turning now to paper and folding boxboard, you see at once that a lot depends upon the intelligent use of these materials—particularly as regards moisture content. The processes of making materials (involving use of bleaches, large quantities of water, and a final drying operation) give ample opportunity for the removal of volatile contaminants and almost complete sterilization of the finished product. The resultant materials are almost odorfree.

Nevertheless you can quite easily perceive a recognizable "board" odor. Under certain circumstances this board odor can be enhanced to where it becomes a danger. Thus when reviewing sources of odor complaints you must always consider this possibility.

With flexible films and rigid plastics you find many possibilities for contamination due to chemicals used in manufacturing these materials. Fortunately, however, off-odor and/or off-flavor complaints directly attributable or traceable to the materials themselves are quite rare.

Even so, film manufacturers must be extremely careful to ensure that any solvents used in manufacturing processes are completely removed. Plasticizers used to give the desired flexibility to the film must not migrate or give off-odors, and the coatings, if present, must be formulated even more carefully since they come in direct contact with the contents of the package.

Printing inks. Both the material being printed and the printing process employed govern the type of ink used on a particular job. But all inks—regardless of the material being printed and by what process—share one thing in common: *they should eventually dry.* Essentially it is the method of drying that differentiates one type of ink from another.

Printing inks have quite justifiably been blamed for many odor complaints in the past, a situation likely to continue for some time. There seems to be no easy way around the difficulty. However, greater realization of the properties of inks is helping to reduce the trouble, even if complete elimination does not yet seem possible.

Adhesives. In the past 20 years the range of adhesives has widened considerably. Traditional *natural* products such as starch, dextrin, casein, and animal glues are being supplemented and in some cases replaced by the *synthetics* such as polyvinyls, polyamides, polyesters, and rubber derivatives.

Under suitable conditions, natural materials are susceptible to bacterial degradation and support mold growth, producing unwanted odor. Although the synthetics are almost completely free of this trouble, they generally contain solvents and plasticizers which may cause odor trouble if you don't take due care in driving off the solvents and/or in using odorfree plasticizers.

Product-Package Sources

You can keep many products in a grossly contaminated atmosphere without their becoming contaminated. Other products are very susceptible and cannot stand even a suspicion of odor in the surrounding atmosphere without becoming tainted. In general, if you have fats or oils present in foodstuffs, it leads to sensitivity to odor pick-up. This is probably due to the solubility of odorous materials in the fats. Cosmetics impregnated with oily substances or toilet goods containing essential oils may dissolve wax liners or coatings and penetrate other types of packaging materials.

You may find the product itself responsible to some degree for odors produced by the packaging

material since the packaged product very quickly establishes an "equilibrium relative humidity." This means there is a relative humidity in the atmosphere surrounding it which causes neither drying out of product nor absorption of water vapor.

Conditions of high humidity enhance the residual odor of some packaging materials, particularly paper and board. They also enhance the tendency toward mold growth. Thus board odor is more likely to contaminate a product which must retain a high moisture content, for example, than one which is continually trying to pick up moisture and maintains dry conditions within the package.

External Sources

Contamination from without comprises one of the main sources for odor problems and is perhaps one of the most dangerous. You can seldom detect the odor source immediately, especially if the products contain essential oils. With time, the absorbed odors blend or combine with the contents to produce an entirely different odor. The new odor may be completely objectionable.

Barail *(1)* cites an instance where cold tablets in metal tins not tightly closed and headache remedies in glass bottles with caps not screwed tight were contaminated by a leak in the solvent room in the vicinity of the warehouse to such an extent as to make them unfit for consumption.

To a certain extent you have control over materials handling, storage, and warehousing and can take every precaution to eliminate these as potential sources of odor transmission. However, you have little, if any, control over distribution channels. Trucks, trains, planes, holds of ships, distributors' warehouses, retail outlets, and even the consumer's pantry may be the cause of an odor problem. In investigating a complaint you should not fail to include them as possible sources.

MINIMIZE ODOR EFFECTS

A realistic approach to the odor problem presupposes that odorous materials are always going to be used in packaging and then seeks to minimize the effects of their use. For example, to eliminate the possible contamination due to printing ink, you could dispense with surface decoration altogether!

A more sensible approach is to (1) assess the odor risk accruing from the use of surface design; (2) apply the design by the printing process and inks best suited to minimize the risk (but consistent with the machinery available); and (3) take steps throughout production to make sure you give the odorous substances the greatest chance of dispersing.

Various aspects of package construction and production deserve consideration with a view to minimizing possible odor troubles.

Package Construction

You should tackle the odor problem right from the beginning when you decide on the makeup

GO AFTER ODOR QUESTIONS AS SOON AS YOU START PLANNING YOUR PACKAGE

of the package. If your product is susceptible to contamination from the package, it is also susceptible to odors which penetrate through the package. Therefore, you must build an odor barrier into the package. This can be a two-edged blessing, stopping odorous materials traveling in both directions. You must therefore site this odor barrier as near the product as possible.

If you put the odor barrier on the outside of the package, you

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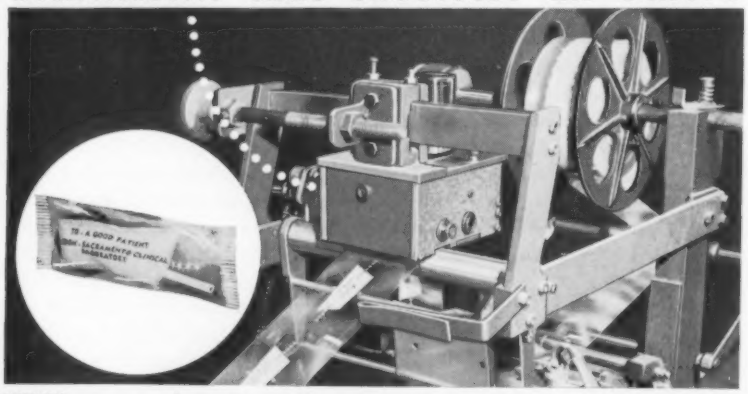

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A summary of test results, as approved by Container Laboratories, Inc., is available on request. Write to Dept. T. Ask for "Evaluation Booklet."

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lock up the other package components with the product. Thus a slight odor emanating from the packaging material inside the barrier can quickly build up a concentration which contaminates the product.

For example, regenerated cellulose film is a material commonly used as an overwrap to give "extra" appearance and protection to a printed carton. But this film is an odor barrier, and you should use it only in the full realization that it increases odor trouble unless you take proper precautions with the rest of the carton. From an odor standpoint, an ideal but perhaps not practical way to use this film as a barrier is in the form of a liner next to the product.

When you consider the makeup of the package, you must know the nature and characteristics of the product; otherwise you cannot assess the degree of protection required against transmission of water vapor, gases, grease, oils, and flavors so that you can design the container accordingly.

Let me again stress the point that a product which has to be kept moist within its container is a more dangerous "animal," odorwise, than one which has to be kept dry. High relative humidity inside the package brings out the natural odors of paper or board, promotes degradation of natural adhesives unless (odorfree) preservatives have been incorporated, and permits any mold spores incorporated in the board during its conversion to grow and produce mustiness.

Laminations And Coatings

Use of laminations or coatings offers a logical approach to product protection but can also introduce odor troubles. If one of the plies of your lamination is permeable to moisture, the water-based laminating adhesives should not give trouble. However, if the manufacturer leaves the lamination with too high a moisture content, you might get mold growth.

Wax adhesives or surface coatings rarely give trouble if you take reasonable care not to overheat the wax and thus degrade it. You can use certain antioxidants to reduce the risk of trouble from overheating, but you must be sure that their use complies with government regulations.

Specifying a lamination of two impermeable plies might introduce an odor problem because of the nature of the bonding resin. You can rarely use odorfree solvents in this laminating operation. Thus if all traces of solvent are not removed before laminating, they will be trapped and released gradually over a long period of time. This slow release can gradually build up a concentration within your package and contaminate the product.

Extruded polyethylene coatings can be completely odorfree when applied to porous substrates such as paper or board. However, if you specify extruded coatings on film or foil having a smooth impermeable surface, there is a real danger of coating degradation with the production of odors. In fact, you can only achieve the bond between the coating and substrate by degrading the polyethylene. Thus if the manufacturer does not control temperature exactly, the lamination may give you an odor problem.

Ink-Drying Processes

Since the ink-drying process rather than the actual printing process affects the odor problem, the different drying mechanisms will be described but only insofar as they relate to minimizing odor problems. Generally, printing inks are dried by absorption, precipitation, oxidation/polymerization, and/or evaporation.

Absorption drying. Generally, absorption drying results in a small quantity of practically odorless high boiling hydrocarbons being absorbed by the paper or board. So far as is known, this has not led to any cases of contamination or odor complaint. However, if your supplier uses absorption drying, make sure he uses only pure grade hydrocarbons which will gradually disperse without leaving any "tails" or contaminating residues.

Precipitation drying. With this method you precipitate the resins and color pigments from their solvent by the addition of water, either from the paper being printed or as a jet of steam playing on the surface. The solvent then soaks away into the surface.

From the odor standpoint the steam-set inks are the best as their solvents are almost completely without smell. However, the degree of rub-proofness is not very high and may give you trouble in subsequent operations.

Oxidation/polymerization drying. Oxidation-type inks, which will run on the press without drying on the rollers, take several hours to dry on the printed surface. During this whole time odorous by-products are evolved.

The stacks of printed work cannot be disturbed until the ink is dry enough to resist smudging, yet if kept together too long, the odorous by-products of the reaction can be absorbed by either the cellulose fibers or resins in the paperboard.

Preferably these odors should be dispersed as they are produced —the sooner, the less chance of board contamination. You will find this very difficult to rectify; yet board contamination can so easily

Roger W. Martyn holds a master of engineering degree from Liverpool University. He joined Mardon, Son & Hall in 1949 and started its research and development department in printing and packing. Mr. Martyn is chairman of the Institute of Packaging steering committee on odor in packaging of foodstuffs, and a branch chairman and national councillor of Institute of Packaging. He is an Associate Member of the Institute of Mechanical Engineering and also belongs to TAPPI, Association of Printing Technologists, British Paper and Board Makers Association, and PATRA, being chairman of its packaging advisory panel.

be transferred to the food product.

Evaporation drying. Some manufacturers dry gravure and flexographic printing inks by evaporation. This ability to "dry" an ink film in a fraction of a second confers advantages made full use of when subsequent operations such as waxing of bread wraps, or "in-line" cutting and creasing of container blanks is done immediately after printing.

Examinations of complaints show solvent removal as the major source of trouble with evaporation-dried printing. Evaporation drying is comparatively simple when using certain resins and almost odorless solvents. However, inks which can print on "difficult" surfaces such as moistureproof cellulose film or foil use odorous solvents and have a tendency toward solvent retention.

Excessive drying is not the answer because almost complete removal of moisture results in brittleness, unhandleability, and shrinkage. This is not rectified completely even by rehumidification.

The fact that users get almost all impermeable flexible packaging materials in reel form is another cause of much odor trouble. The printed material, re-reeled immediately after printing and drying, gets no further exposure to air until the user runs it. Thus residual solvent cannot disperse because of the impermeable nature of the material.

Similarly, heat treating reels of wrapping material to disperse odor —a practice widely adopted by users—is a poor solution to the problem. It is inefficient in that the surface area exposed is very low, and the solvent must creep along between tightly wound adjacent layers before dispersing.

In the past many attempts were made to correct odors emanating from printed matter by incorporating a "reodorant." This masks the undesirable smell with one which is acceptable and even pleasing to the user. Where foodstuffs are concerned this idea has several drawbacks: (1) contamination caused by one odorous material is hardly

REODORANT MAY GIVE YOU MORE SMELL THAN ODOR YOU'RE TRYING TO MASK

affected at all by the presence of another; and (2) it is unlikely that the balance between reodorant and original smell will remain constant. Usually the smell of the reodorant gradually fades, and the original smell becomes increasingly apparent.

In general, the use of reodorants is to be discouraged; there is always the danger of adding something worse than the odor you seek

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to mask. Concentrate on preventing the undesirable odor from being retained rather than trying to patch up an unsatisfactory situation.

INFLUENCE OF MACHINERY ON ODOR PROBLEMS

You might think that package makeup and filling operations have no connection with odor problems. Indirectly they are connected, often requiring a degree of rubproofness of the print in excess of that normally required by subsequent handling of the filled package.

You need considerable forces to fold, erect, close, seal, and handle a container. On presently available machinery this involves severe rubbing of the surfaces. Accelerating machine speeds increases the degree of rough handling of the container as it is being formed and filled.

Therefore, the printing on these surfaces must be very rub resistant. This necessitates inks potentially more odorous than otherwise needed, unless you can adjust your design to keep the print clear of the rubbed areas.

In general, a lack of knowledge of container material properties and/or failure to take them into consideration in machinery design can accentuate the odor problem unnecessarily. It can also damage a package which would otherwise stand up in normal handling and journey hazards.

It is easy to blame the machinery manufacturer for troubles which are partly of your own making. Nevertheless, coming to grips with the odor problem, among others, requires the coordinated efforts of the materials suppliers, machinery manufacturers, and users. All are concerned, and all must shoulder their share of the responsibility.

TEST FOR CONTAMINATION

The interrelation of product to package is another important factor you must consider in determining the source of an odor problem. You will find this interrelation equally important in evaluating over-all product/package performance.

Some products are much more susceptible to odor contamination that others. This susceptibility varies considerably in and among product groups, particularly where formulated products are concerned.

On the other hand, resistance of packaging materials to odor impermeability is highly specific. Some odors are extremely difficult to contain or exclude; others you can shut in or keep out by almost any nonporous packaging material.

Thus the same package or container may have entirely different effects on two different types of products or on different formulations of the same product. The only sure way you can find out whether the combination of contents and package materials is suitable, odorwise, is to conduct storage trials over a reasonable period of time.

(Turn page)

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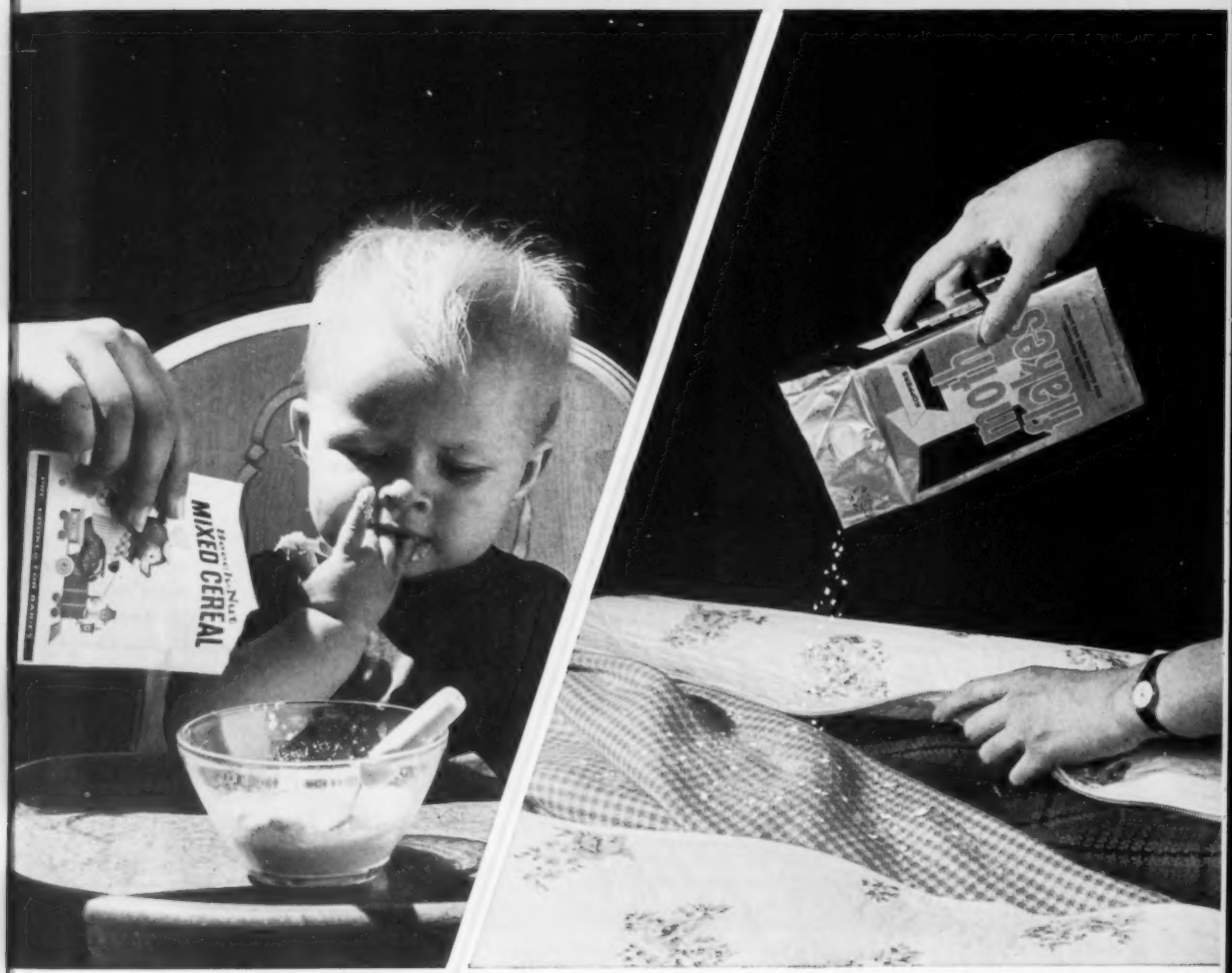

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Stopping the penetrating odor of moth flakes was a packaging problem until a Marathon foil fiberseal overwrap provided the answer. Result: the manufacturer added product distribution in food and drug outlets.

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There is a great temptation to accelerate results by adopting artificial conditions such as elevated temperatures and high humidity to bring out the worst in the package. In moderation, such acceleration is acceptable, but you must be very careful not to use too great an acceleration factor.

An example of this is raising the temperature to levels where it affects the container in a way which cannot occur in actual storage for a very long time. To cite an extreme example, the odor from a wax coating, slight though it is, can be accentuated by raising the storage temperature from 60°F. to 100°F., but the process cannot reasonably be carried on to 140°F. because the wax may have melted by then.

The *actual* conditions you select for storage tests are not vital, and you can choose these to suit your particular test equipment. However, it is important that you standardize on one or more sets of conditions, eliminating as many variables as possible.

Preparing Experimental Packages

Since Birdsall *(2)* discussed thoroughly the steps involved in preparing experimental packages for testing, only a short summary is necessary here. Briefly, you should:

1. Prepare packages, if possible, in the sizes and forms in which they will eventually appear on the market. This eliminates the need for extrapolating results.

2. Make test conditions realistic —give the product as severe a treatment during experimental operations as it would get under actual commercial production. Simulate actual handling, product preparation, and all other unit operations.

3. Test enough packages. The number depends upon storage time, sampling frequency intervals, factors to be evaluated and the amount of material and/or product needed for each test.

4. Space tests for quality according to storage conditions and normal stability characteristics expected of the product *(2)*.

Odor Tests Subjective

Odor and contamination tests are essentially subjective in the sense that they depend on reactions of

YOUR OWN NOSE IS TOPS AS SENSITIVE DETECTOR, OUTSMELLS LAB DEVICES

individuals who have no means of comparing the actual sensations they receive. But we should not discount the value of our noses as

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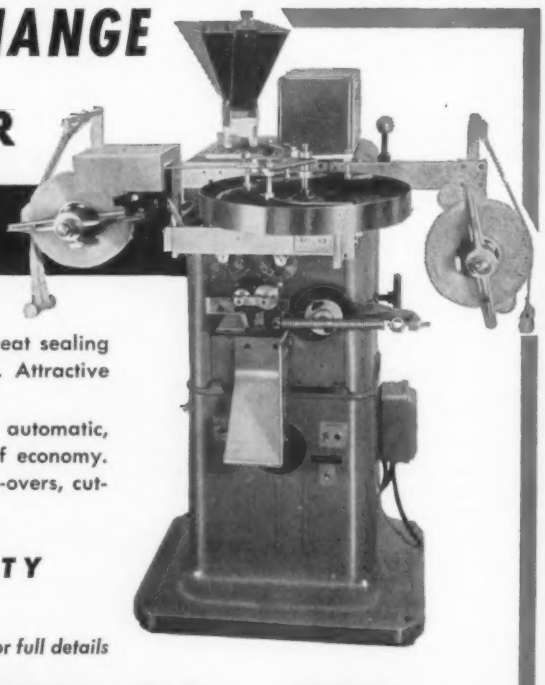

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TABLE

General Tests For Odor In Packaging Materials

Type Of Test	Method	Results
Preliminary crumple test	Crumple sample and rub between the hands to bring out odor. Bury nose well into crumpled ball and sniff gently.	Detectable odors include uncombined monomer, plasticizer, residual coating solvent, lubricants, or antioxidants.
Bottle test	Strips of sample placed in glass stoppered bottle to allow odor to build up; detected by sniffing.	Odor can often be recognized as board, ink, wax, solvent, etc.
Oil transfer test	Strips of sample placed in bottle containing dish of odorless mineral oil. Sample not in contact with oil. Oil tested after 24 hr. by sniffing.	Odors soluble in oil (varnish or ink drying products, some gravure solvents) will be concentrated.
Butter pickup	Similar to above but fresh sweet butter used instead of liquid. Butter tasted after 24 and 48 hr. and compared with control sample.	Very sensitive test for volatile grease-soluble odors.
Chocolate pickup	As for butter pickup test but using milk chocolate.	Cocoa-butter is very susceptible to odor contamination, and slight flavor changes are readily discernible.

effective instruments of odor detection. There is nothing more sensitive. We can unquestionably detect parts per million and probably even parts per billion. Not even the best available mechanical or instrumental detection means can do anything like this *(4)*.

Actually there are no really objective or quantitative physical instruments which you can use to measure odor, with the possible exception of the Osmagraph—a precision instrument which extends the sensitivity of the nose somewhat as the microscope does the eye *(1)*. It has a wide range so even faint traces of odorous substances can be easily detected with it. However, most package users depend upon human response (a sensory measurement) as a means for measuring odor characteristics.

You can usually do odor evaluation tests in conjunction with flavor evaluation using similar techniques and scoring scales. In the past 10-15 years, many researchers *(5, 9, 12, 13, 14)* have given attention to developing *objective* methods for assessing *subjective* quality measurements directing attention toward defining stable grading and scoring procedures for food quality characteristics. Others *(6, 7, 11)* contributed valuable information toward quantification of subjective measurement in other fields.

Tarver and Schenck *(10)* demonstrated the usefulness of standard statistical techniques in developing an objective scoring system for grading the subjective quality characteristics of foods. By using these objective scoring scales for evaluating quality, you can minimize the main difficulties normally associated with subjective sensory scales, namely their instability or tendency to drift in meaning with time and with judges.

Detect Quality Variations

Although every product has its own characteristics and susceptibilities, nevertheless you can detect variations in the quality of packaging materials supplied which may affect their performance.

A series of general tests appears in the table. You should not use these tests to replace the more specialized storage tests of the product in its container. You should use them as an adjunct to your storage tests. They may give an indication that something is wrong long before the storage test confirms it.

CONCLUSIONS

At the present time there does not appear to be any prospect of a complete answer to the odor problem. In time this may come as we (1) develop a better understanding of the factors involved; (2) acquire more knowledge about the materials used in package construction and decoration; (3) apply scientific and technological advances to the development of better machinery; and (4) develop better control over distribution (as it relates to odor transmission) or find ways to guard against the potential hazards involved.

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Increasing line speed is not the only way to improve the efficiency of your packaging line operation. Mr. Kellar shows how the addition of semiautomatic equipment and homemade gadgets helps maintain the flexibility necessary to package different sizes of several products, and improves line efficiency without increasing speed. He points out you should, when possible, use simple gadgets to do simple chores (e.g., case stenciling) to take better advantage of a man's time and skills in other work.

Improving line efficiency without boosting line speed

By W. A. Kellar
General Superintendent
Cook Paint & Varnish Company
Kansas City, Missouri

CONVEYOR SYSTEM takes cans (left to right foreground) from filler to labeler. Powered conveyor, inclinde 30°, forms bridge with roller conveyor, which takes cans to labeler. Arch is high enough to get carts under. Power section raises out of way when not in use.

AFTER LABELING, chain conveyor moves (left to right) single row of cans to dead plate. Lead can hits trip lever causing pneumatic ram to push cans from dead plate to casing table. Ram has different face plates for various size cans. Changeover takes less than 1 min.

Maintaining flexibility in packaging line operations does not mean sacrificing efficiency. We recently added a semiautomatic case packer and a home-built case marker to each of our two packaging lines. As a result, we released three operators from hand work on our lines for other work.

We package paints and finishes in ¼-, ½-, and 1-pt., 1-qt., and 1-gal. metal cans on either of two lines. (We also fill 55-gal. steel drums but do not consider this a part of our line operation.) Our operators make simple, quick changeover adjustments on our equipment to switch from one container size to another.

How We Fill

Pumped through permanently installed steel piping, paints and finishes flow through a strainer above an open pan. From this pan, paints flow by gravity through another pipe into the infeed reservoir of our Elgin piston filler.

By changing the piston stroke, our filler adjusts to different filling capacities for our five different can sizes. Typical filling rates: 12 1-gal. cans/min., and 32 ¼-pt. cans/min.

Empty cans, unloaded on an upper floor of our plant, roll by gravity along guide tracks to the filler. As the cans move into the filler, a powered steel plate conveyor on the filler carries them along to a finger stop which indexes them under the filling spout. The conveyor belt moves continuously and slides under the can while the finger stop holds each can in the filling position.

Knack Of Coding

When the can is full, the finger stop automatically releases it. It then moves along the conveyor to an Elgin capper which automatically presses a double-friction lid onto the can. Then the conveyor carries the cans under a Bowers automatic coder which stamps an ink impression on the gallon, quart, and pint sizes. Fractional pint cans are too small in height and diameter for automatic marking with this equipment. Also, there is not enough space on the top of the smaller cans to take our code information in the size of type we use with our automatic coder. An operator codes small cans with a rubber stamp and ink pad.

This code serves two purposes: (1) it identifies the paint and the date of run, and (2) lets us remove unlabeled cans from the line for storage—ensuring that we get the correct label on the can later. This lets us fill one type, color, or can size of paint at the same time we run a different size, color, or type on our labeling and casing equipment.

This is one technique of getting flexibility—we can economically fill and seal, or label and case, short runs (say, 10 cases) on a rush order basis.

Conveyor Bridges Aisle

Leaving the filler, the cans make a 90° turn, go through an opening in the wall, and move up an inclined, powered conveyor to our Standard-Knapp labelers. Because the conveyor crosses an aisle-way, we installed it so people can move under it while it is running.

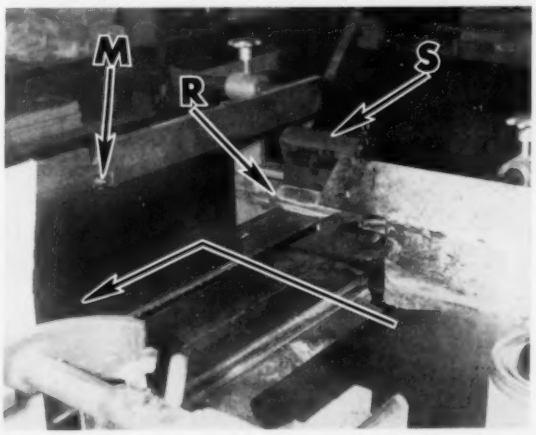
This system consists of two types of conveyors which fit together but are not permanently joined. The conveyor which goes through the wall raises out of the way when not in use; it angles upward about 30° when running. This conveyor has a rubber belt with diamond-shaped treads to keep cans from sliding and to keep them moving up the incline.

The other half, a permanently installed, unpowered roller conveyor angled downward, feeds into our Standard-Knapp labeler. Thus, the two conveyors meet, crossing the aisle, to form an arched "bridge" over the aisle. They are elevated about 4 ft. so we get carts of packaging materials under them.

After the cans reach the top of the arch, they roll down through a can twist which turns each can onto its side, ready for the trip through the labeler. *(Turn page)*

OPERATOR PLACES CASE over cans just pushed to casing table by pneumatic ram. He folds bottom side flaps outward, fits bottom end flaps through slots in casing table, and then pushes case away. Guide bars under table fold end flaps up under cans inside case.

STENCIL (S) is cloth-covered rubber pad on steel backing plate. Cases enter from right, actuate Micro Switch (M) causing ram (R) to push case toward sealer. Spring-loaded stencil on ram contacts case, marking it as ram pushes case. (Arrow shows travel direction.)



W. A. Kellar is a graduate of The University of Kansas with a B.S. degree in chemical engineering. He joined Cook Paint & Varnish Company in 1935 as a research chemist. In 1945 he assumed his present position, general superintendent of the North Kansas City factory.

Labeled cans roll through another twist, turning them upright and discharging them to a powered steel plate conveyor. Making a 90° turn upon leaving the labeler, the cans move to our Thiele semiautomatic case packer.

Cans Meet Cases

We tapped our 80-lb./sq. in. plant air line to operate these casers —one on each line.

As the single row of cans moves along the conveyor from the labeler, a powered steel-plate conveyor pushes them across a dead plate and up to a trip lever. When the lead can in the file is pushed (by the cans behind it) against the trip lever, a pneumatic ram mounted at the side of the dead plate pushes one or two cans—depending on their size—at right angles to their previous line of travel and onto the casing table.

The ram has different face plates to fit different can sizes. One plate is wide enough to push a single gallon can onto the casing table, another plate pushes two quart cans onto the table, and a third is used for two gallon cans. We also use the face plate for gallon cans to push pint and fractional pint cans onto the table. Holes in the face plates fit onto two pins extending outward from the ram, holding the plates in place. Changeover takes less than a minute.

Using different sizes of face plates contributes to the flexibility we need for packing different sizes and numbers of cans into each case.

Packing Half-Cases

This is how the equipment helps us pack a "half-case"—two gallon cans in a corrugated shipper: a can moves across the dead plate and up to the trip lever. The ram pushes the can onto the casing table and moves back to its original position. When the next can trips the lever, the ram pushes both cans up against a locking bar on the casing table which prevents the ram from pushing more cans onto the table until the filled case is pushed out of the way.

The operator working here places bails on the cans (gallon cans only) and opens a 175-lb.-test B-flute corrugated shipper. Folding the bottom side flaps outward, he places the case down over the cans, with the bottom end flaps fitting through slots in the casing table.

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Now he pushes the case away from him, and guide bars under the casing table fold the end flaps up, under the cans in the case. As he pushes the case onto a dead conveyor plate, the case pushes past a finger switch, releasing the ram to push more cans onto the casing table.

We use the casing equipment to pack all our different cans, but since we pack the pint and fractional pint cans in two layers in shippers, we use the ram only to push the cans onto the casing table. The operator stacks them in the cases by hand.

When the filled cases reach the conveyor plate behind the casing table, they trip a Micro Switch in the conveyor plate guide rail, operating another pneumatic ram which pushes the cases along toward our Standard-Knapp automatic case sealer.

Build Own Case Marker

Here we mounted a home-built case marking device. This releases one man to work elsewhere in the plant. Before we installed our case markers, an operator marked cases by hand and supplied them to both lines. We had to stencil the cases before making a run, and we frequently had extra cases, or not enough, for a given run.

This marking stencil is a 3x5-in. cloth-covered foam-rubber pad mounted on a steel backing plate of the same size. The ⅛-in.-thick plate is welded to a 1-in.-diameter grooved steel rod which fits through an "eye" mount.

A compression coil spring on the guide rod—between the stencil plate and the eye mount — holds the plate away from the mount, ready to mark each case. A ⅛-in. bolt with a wing nut welded to it screws through the mount into the groove in the guide rod, keeping the pad from moving out of the mount during case marking. Mounted on the arm of the ram, the stencil pad is in the same plane as, but protrudes a little beyond, the ram face plate. Thus the stencil contacts the end of the case before the pneumatic ram does.

To prepare for marking, we just ink the pad, place a standard Mimeograph stencil with the necessary information over the pad, and put the steel guide rod through the eye mount on the ram. To change stencils, we unscrew the wing bolt, change the stencil, and put the pad back into the mount.

Action Of Pad

As the ram moves forward to push a case toward the sealer, the stencil first contacts the case. The spring on the guide rod lets the pad move backward until the ram contacts the case to push it along the conveyor.

While the ram moves the case forward, the spring holds the stencil firmly against the case to make a clear impression on each box. As the ram moves back, the spring releases the stencil to its starting position—ready to mark the next case.

This technique lets us identify cases as we use them. And we do not have an under- or oversupply of properly marked and addressed shipping cases. After the cases are marked, they go through our case sealer and are hand palletized for storage or shipment.

Improved Efficiency

Before we installed our semiautomatic casing equipment, we needed two men to case filled cans for each line. With this equipment we have released one man from each line for other work in our plant.

As a direct result of adding semiautomatic equipment and simple gadgets to our lines, we have increased the efficiency of our packaging operation 43 per cent by releasing three men (two from casing and one from case marking) for productive jobs elsewhere.

Since our production speed is limited by our filling equipment, our improved efficiency comes not from increased speed (as is often the case) but from making better use of manpower while maintaining flexibility. *(End)*

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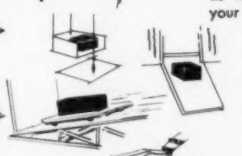

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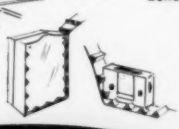

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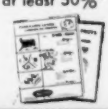

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Polystyrene sheeting intrigues packagers

Pressure forming this biaxially-oriented sheeting offers many container possibilities. A close look at the cons as well as the pros helps you decide how it fits into your particular needs.

Users and suppliers of packaging alike are now taking a close look at the growing list of container applications involving biaxially-oriented polystyrene sheeting. Reports indicate that pressure forming permits making it into almost any sort of container—including shapes not practicable with vacuum forming. But before looking into problems of use, a review of the background on this material may be helpful.

Biaxially-oriented polystyrene sheeting appeared on the market as a packaging material some three to four years ago after several years of research and development work. Plax Corp. introduced heavy gauge sheeting; The Dow Chemical Co. and Union Carbide Corp.'s Plastics Co. and Visking Div. since have made or are making films and/or sheets.

The larger share of the heavier gauge sheeting material market has, by plastics suppliers' admission, belonged to Plax, but other suppliers assert they are building added capacity to catch up.

What Sheeting Is

Bi-oriented polystyrene sheeting comes in roll stock, running in thickness from 0.003 to 0.050 in. Sheeting gauges are thicker than films (experimental or practical, these run from 0.0001 to 0.003 in.) and not as thick as styrene foams formed from granules.

Useful gauges for forming containers run in the 0.010- to 0.015-in. range, producing containers commonly called "semirigid."

How To Form It

Containers of bi-oriented polystyrene sheeting can be either vacuum- or pressure-formed, according to J-E Plastics Manufacturing Corp., but pressure-forming methods are more effective in making typical sizes of containers. The reason for this is that you cannot heat the plastic material to a high enough temperature to soften it enough to get a deep and usable vacuum-formed container without disorienting and distorting the plastic sheet.

By pressure-forming the containers, you get a good fit between base and cover. This forming allows for shrinkage of the finished container after the forming process. Covers making a 90- to 95-per-cent effective seal against moisture (assuming a good heat seal to be 100-per-cent effective) are obtained by pressure forming.

Users have several ways of closing containers made of oriented polystyrene: snap-in, snap-over, and heat-sealed lids. Snap-in lids fit much in the way a fibre top fits into a glass milk bottle neck; snap-over lids fit over the outside perimeter of the container lip. Such lids are currently available for round, square, and rectangular containers.

Current interest centers around

oriented and/or heat shrinkable films, according to the research director of a leading food company. And while oriented sheeting is not literally new, some types are now finding new uses—such as for semirigid containers. Thus polystyrene gets a new lease on life.

Sheet's Physical Properties

In deciding whether you find a particular packaging material useful, you need to note differences between different materials in the same general category—e.g., films. You should also note the differences between similar grades of the same film or sheet supplied by different manufacturers.

Some grades of oriented polystyrene may just suit your packaging. A comparable grade from another supplier may not. According to the manager of packaging research of a large dairy products company, there are differences in the properties of similar grade and caliper sheets from different producers. This suggests close evaluation rather than simply assuming their similarity.

HOW TO JUDGE IT

Discussions with package users focus generally on WVTR, gas transmission, and brittleness characteristics of the sheet material. Oriented polystyrene sheeting—even in fairly heavy gauges—0.001 in. for example—has a fairly high moisture transmission rate. This is drawing much attention.

In examining 0.001-in. oriented polystyrene's 0.7 gm./100 sq. in./24 hr. transmission, another food company research head points out that unfolded 195 MST* 54 cellophane has a WVTR of 0.2 to 0.4 gm. under comparable test conditions. He notes further that the folded cellophane (as in a package) has a rate about ten times as high.

In keeping a dry food dry, you may need a lower transmission rate—say 1/10 of the rate for unfolded cellophane. Saran, for example, has a test transmission rate of about 0.05 gm.

If, on the other hand, a little moisture transmission is all right or even desirable, this 0.7 gm. transmission rate may not be too high. Even though you are talking about a rate twice as high for polystyrene over unfolded cellophane (0.7 over 0.4), the difference may not be enough to worry about unless moisture protection is critical.

Under ambient conditions, WVTR of 0.7 may not make any difference, according to dairy people. As they put it, "How many products do you store at 100°F. and 95 per cent R.H.?"

Gas Transmission

Gas transmission rates and WVTR's are not necessarily related. A plastic material may leak like a sieve as far as moisture is concerned and still not have a high enough gas transmission rate to be useful for fresh produce.

A packaging expert at a leading Eastern university points out that fresh corn, peas, and asparagus have very high respiration rates, requiring a film or sheet with a high oxygen and carbon dioxide gas transmission rate to keep them fresh.

Respiration in fruits and vegetables is similar to that of animals—they take on oxygen and give off carbon dioxide. Fresh produce keeps fresh for quite long periods when it can "breathe" properly. "Hardware" items such as carrots and potatoes do not need films or sheets with high gas transmission rates because they have low respiration rates.

Toughness/Brittleness

According to one supplier representative, polystyrene is an inherently brittle material—but not brittle in the same sense that glass is brittle, i.e., fracturing on impact.

It is a tough sheet material due to the orientation process, but not as tough as the acetates, buty-

Physical Properties Of Biaxially Oriented Polystryene

Property	Data
Visible light transmission	92%
Aging characteristics	Indoors—excellent Outdoors—limited
Dimensional stability	Outstanding
Tensile strength (1-10 mil, both directions) (ASTM D882-56T)	9,000 to 12,000 lb./sq. in.
Modulus of elasticity in tension (ASTM D882-56T)	450,000 lb./sq. in.
Heat sealing range (contact method)	250-300°F.
WVTR (0.010-in. sheet)	0.7 gm./100 sq. in./ 24 hr. at 100°F., 95%R.H.
Gas permeability (1-5 mil range) (ASTM D-1434-58)	cc./100 sq. in./24 hr./ mil at 73°F., 1 atm.
Oxygen	213-300
Nitrogen	42-65
Carbon dioxide	790-926
Air	62-90
Resistance	
Weak acids, alkalies	Excellent
Strong acids, alkalies	Good
Organic solvents	Good to poor
Alcohols	Good
Lubricating and vegetable oils	Generally good
Mineral oil	Generally excellent, some exceptions
Minimum use temperature	Sub-zero
Maximum use temperature	200°F. for brief exposure
Flammability	175°F.

*New code designation for 300 MST 54.

rates, and vinyls. However, these materials all cost more than oriented polystyrene. This suggests two questions: How much toughness do you need in the sheet? How much are you willing to pay for that strength?

The "two-way stretch" manufacturing method makes this material less apt to split under cool temperatures, according to a laboratory director of a large food processor and packager. Biaxially-orienting the styrene makes it less likely to crack at temperatures in the ordinary freezing range—that is, from –20° to –30°F.

A representative of another supplier points out that this material is relatively stiff compared to polyethylene. He asserts also that its ability to resist fracture at low temperature does not change appreciably from the resistance the sheet normally has at room temperature.

The point is this: oriented polystyrene may well split upon impact at low temperatures (as low as –60° to –70°F.), but the tendency to split or crack is far less than for a similar size and shape container made of, for example, high-impact polystyrene.

Perhaps, one research director notes, this material is flexible enough to bend around a dowel at –80°F.; however, this is not the point. Orienting the material helps, but it is still not tough enough to avoid possible splitting if you drop a container this cold onto a hard surface.

Super Cooling: Yes Or No?

Discussion of a new development in quick freezing methods also comes up when packagers talk about oriented polystyrene. Industry people seem interested in the possibility of quick freezing packaged products in a liquid nitrogen (–320°F.) bath. This (if feasible) would eliminate the need for large, expensive sub-zero freezing equipment.

A converter asserts that oriented polystyrene containers are suitable to processing in this manner—stating that the toughness properties of oriented polystyrene which are unchanged from room temperature to –30° and –40°F. are also unchanged at –320°F.

One supplier representative concurs in this view, qualifying his statement by saying he has heard of this super-cooling being done but that he has not seen it done, nor is he aware of the results.

Another supplier representative doubts whether oriented polystyrene will stand up under this severe a test: it might work under a momentary cold shock, with no movement of the packaged product, or external disturbance of the container.

He points out further that polyethylene is admittedly the best cold-temperature packaging material, but that it, too, is not a panacea. He suggests that considerable research and development work is necessary before anyone can categorically state that oriented polystyrene will stand up

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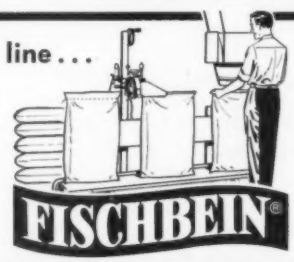

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under this extreme condition—-320°F.

All this leads to the impression that this is a new, relatively unexplored area showing promise, with good points and bad. A packaging material that can stand the extreme cold shock would spark further development of the processing method. However, the development itself is still in the investigative stage.

MATERIAL HAS ASSETS

Conversations with users and suppliers suggest that oriented polystyrene is about the clearest sheet material on the market. This, also according to consensus, is the material's biggest asset.

FDA Approved If "Safe" Level

Federal Food and Drug approval is given oriented polystyrene containing a free, residual styrene monomer level "that you can prove is safe," according to the laboratory director of one food packaging company. This level, another expert agrees, hasn't been precisely pinned down—mainly because it is hard to do by simple chemical analysis. Extraction by chemical processes, as a means of determining free monomer level, is not too accurate.

The test generally comes down to an odor standpoint. The free styrene monomer by itself is not considered harmful. However, it does have a strong, kerosene-like odor which damages most foodstuffs when free monomer is not driven from the finished sheet material.

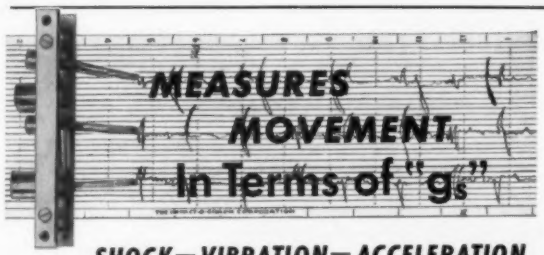
Our impression from conversations with FDA officials is that the safe level for free styrene monomer is based on "good manufacturing practice." This may be as low as 3/10 of 1 per cent but also goes higher.

The "safe level" is not pinned down; FDA approval was given for food packaging under prior sanction. This sanction appeared in an article referring to approved and unapproved materials published by Dr. Arnold Lehman in the October 1956 Quarter Bulletin of the Association of Food and Drug Officials of the U.S.

The free monomer is not poisonous but imparts odors and thus is classed as an additive. A word of warning: the "good manufacturing practices" sanction is coming under fire by FDA officials because some manufacturers are not making suitably low monomer content styrenes. There is speculation that there may be a regulation on the free monomer level in the near future.

The assets of the sheet add up to good appearance. So much so that a Midwestern household products company executive said his company is using the material in spite of added packaging costs. This company's new oriented polystyrene package is more expensive than its previous package, has to be handled more carefully on the line (you can't crush the sheeting, or you damage it), and requires a larger box for shipping.

(Turn page)



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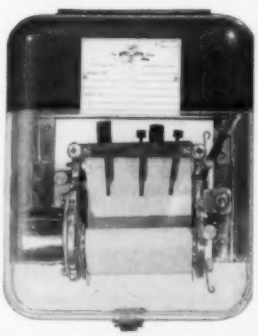

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Although biaxially-oriented polystyrene has been around for some time, its growing use for containers recently prompted our editors to explore its possibilities. So they had a lot of conversations with material suppliers, converters, container manufacturers, packaging researchers, as well as key executives in different types of package using companies. What these people had to say about biaxially-oriented polystyrene for containers adds up to this report. The opinions of those interviewed represent a diversity of viewpoint and help packagers draw order out of confusion concerning this material and its uses.

HAS DRAWBACKS, TOO

A central plains state poultry processor notes that any plastic material presents use problems. He points out that you have to learn just how to run a new plastic material on your particular packaging equipment when you decide to use it.

Admittedly (supplier, converter, and user consensus), oriented polystyrene has only low temperature resistance. Because the material is mechanically stretched under heat during its manufacture, it strongly tends to return to its original shape when heat again reaches it. When there is enough heat to soften it for heat-sealing (or to fabricate containers), it tends to contract.

This limitation puts restrictions on products that you can package in it. Products chilled or stored at room temperatures are no problem. Foods which require heating before serving may have to be packaged in another material. If a low temperature "warming" is all that is necessary, oriented polystyrene will work. If the food needs cooking in the package, this material does not perform.

Poor Moisture Barrier

If your product demands absolute control over moisture transmission through the sheet, this material is not helpful, according to one research head. For example, if you package such dry, hygroscopic products as instant coffee, this material simply will not work —its moisture transmission rate is too high.

Polystyrene needs a good barrier coating on the inside or outside, or both, to keep flavor in and moisture out. Flavor retention in polystyrene is poor although at low temperatures (for example, in grocery store coolers) the volatiles in cheese products would be sufficiently inhibited to make such a material as polystyrene practical, according to the laboratory head of a foods packaging company.

Limits On Package Forms

According to a converter, there are the normal limitations of forming a sheet material in making containers of oriented polystyrene. The area of the sheet you start with, the sheet's thickness, and the depth of the finished container are interrelated. You can have as deep a container as you desire—if you don't care how thin the walls are.

Another research executive agrees: you can't, after forming a container from a flat sheet, end up with much more surface area than you began with in the flat stock, or else the container walls are too thin to be useful. This imposes restrictions on how deep you can form a practical container.

Thus, container forms are largely restricted to wide-mouth shallow trays and cups.

Not Tough Enough

Oriented polystyrene is flexible and tough to a certain extent. However, one custom-packed sam-

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ple shipment arrived at a user's plant with about 50 per cent of the packages damaged. At that time apparently both parties were still learning the material's weak and strong points.

Heat sealing is particularly hard on a finished container. Making an effective heat seal means applying enough heat to disorient the sheet material. This, in turn, makes the heat-seal area brittle. Thus handling costs increase because you have to handle the containers more gently than other packaging materials, according to the executive at the Midwestern household goods company.

The marketing director of one supplier company expressed interest in entering the oriented polystyrene sheeting competition. However, he conceded that the material has a lot of weaknesses. It is brittle, he asserts, although not in the way injection molded containers are brittle.

It is hard to form into containers simply because it is oriented. It scratches and fogs easily. One supplier points out that some grades of its sheet material have good non-fogging properties, however.

Resistance

"The greatest liability of this material is its poor grease resistance. It may well be classed as 'generally good,' but this is not as good as 'excellent,'" one package research specialist asserts. Deterioration of the styrene depends on several considerations, however—how long it is on the shelf, whether the oils are emulsified or free, and the particular grease or oil in question.

And, adds a laboratory director, the crystal clarity and cost of the sheeting are the two things that recommend it. Everything else—scratch-resistance, heat-sealability, WVTR, etc.—is no better than other materials.

HOW TO HEAT SEAL IT

One user states that the material can be heat sealed effectively. He admits there are problems in doing the job, but it can be done.

A supplier representative states that the heat seal range—250° to 300°F.—depends upon the sealing method. He thinks the big difficulty is that heat applied by a bar-type sealer tends to disorient the sheet in the heat-seal area. Unoriented polystyrene is so brittle as to be useless, according to supplier reports.

An impulse sealer works all right on this material, says this supplier representative, but di-electric methods do not. This may be an advantage, however, because you can preheat foods in an oriented polystyrene container by di-electric heating and not harm the packaging material.

Using an impulse sealer, you hold down the material, apply the electrical impulse which makes the seal, and then hold the material unit it cools. This way it does not shrink or distort the package during heat sealing.

A machinery supplier has a semi-

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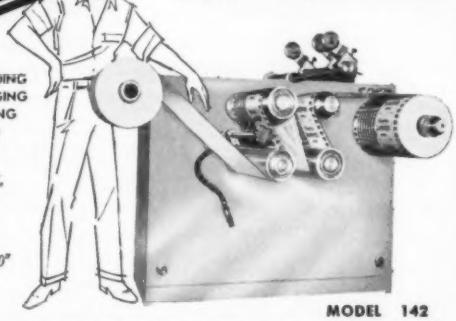

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automatic sealing machine which closes 12 to 15 packages/min. The rate does not depend on the container perimeter as much as on the base and lid thickness. The thicker the material, the longer it takes to get a good seal.

The machinery supplier further asserts that heat sealing is reasonably critical. Although the sealing range is some 50°F. wide, sealing temperatures for given packages of given thicknesses run in 5°F. bands within this range depending on whether the product packed is hot or cold. This means having close, positive control over your heat sealer to maintain good seals.

One way of minimizing disorientation of the sheet is by heating the material just enough to get a tack seal and then folding the flange under (turning it under 180°) to securely hold the top in place. The tack seal makes it moisture tight, and the turned-under flange holds it together.

However, the sealing operation uses one pair of dies for each package shape. The dies of the heat sealing machine grip packages during heat application so they do not shrink or distort upon heating. The point is, says one materials supplier, to apply enough heat to make a seal, but not so much to cause distortion.

COSTS—PRO AND CON

Proponents of oriented polystyrene claim that this material is one of the less expensive materials available to packagers. It costs about half as much as acetates and butyrates—which are also clear sheets. The latter materials show up largely in hardware packaging—they both have characteristic odors which preclude their use in foods packaging.

A clear, semirigid shallow dish or cup, holding 6 oz. (about 3½ in. in diameter and 1 in. deep or so), costs approximately $0.02. This includes a snap-over clear lid.

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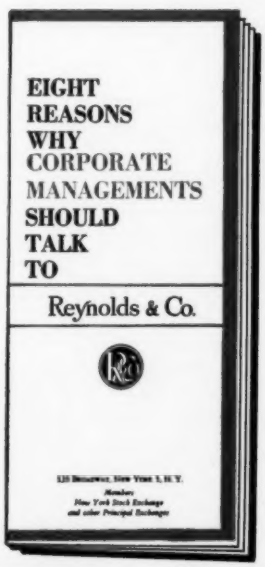

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tion in packaging food items—particularly fresh fruits and vegetables—is cost. And the cheaper, the better. Most fresh produce is quite inexpensive, and packers cannot afford expensive packaging. In this market, price *is* the object.

Compared to fibreboard cartons of equivalent size, polystyrene is rather expensive. Even with a glassine or waxed paper liner, a folding carton is less expensive than a polystyrene cup or tray, according to the marketing manager of the company considering entering sheet competition.

A vice-president of a large toilet goods and household items company says two factors guide the choice of a new packaging material: utility and cost. Utility means protection, handling characteristics, merchandising appeal, etc., and cost is in a comparable category.

Low cost products require low cost packaging regardless of merchandising, handling, barrier properties, etc. This is, however, relative—a $300 crate may be inexpensive compared to a $1,000 crate.

Nonetheless, items such as low cost household products require low cost packaging. Foil-laminated wrappers (for example, for a bar of soap) cost $0.003 to $0.004 cents apiece. Semirigid containers (even for a novelty pack) cannot compete in this price range.

A food company research head asserts that oriented polystyrene containers are not cheap; package for package, he says, many other materials are far less expensive—notably thin gauge coated foils and fibreboard.

Oriented polystyrene, according to a supplier, is not as cheap as polyethylene but does cost less than cellophane. It is more expensive than glassines but does not cost as much as acetates and butyrates.

Still Another View

The Midwestern household products supplier is using oriented polystyrene in place of a polyethylene bag. The tray is more expensive, requires a larger shipping box, and needs "gentler" handling on the line—all at increased cost. This company is marketing its product at no increase in price—stating it is absorbing the added packaging cost internally. Why does it think this tray so desirable? For its appearance, especially its clarity.

Price, according to consensus, is an individual thing for each package. It depends on how much protection you need, against what, desired handling characteristics, marketing impact, and the like. You usually get what you need at a price you can afford in terms of protection required.

Range Of Present Uses

Oriented polystyrene sheeting is currently being used by packagers of widely different products. One company is packaging oiled mop heads in it, another cut and chilled chickens, a third is using lids for various milk cheeses.

The biggest present use, and future potential, for heavier gauge sheeting is for lids for containers made of other packaging materials. Oriented polystyrene makes suitable lids for containers made of fibre, foil, other plastics, and oriented polystyrene.

One of the current uses of this material is for short shelf-life products. It makes little difference if you package items with a limited shelf life what type of container you put the product in—it passes its peak in a matter of a few days regardless of the packaging material.

In cases like this, the most inexpensive (but compatible and protective) package usually wins out. Oriented polystyrene is a good choice here in many cases.

This material also makes good novelty packages. One large soap company put four bars of soap into a long, narrow oriented polystyrene package reusable as a glove box.

An area just opening up to this material: trays for cookies and other baked goods. Using the semirigid container for these products avoids hand filling and handling of creped glassine cups; the material lends itself to automatic handling.

Other uses include—in thinner gauges—envelope and carton windows, produce wrapping, and overwrapping for boxed toys and games. You can use thinner gauges in instances where moisture protection is not necessary—or where high gas transmission is needed.

Where We'll See It Next

One big target market of converters: prepackaged precooked foods in vending machines. A vice president of a canteen service states that oriented polystyrene containers may be heated indefinitely at temperatures as high as 170°F. While this is not enough to cook most foods, it is hot enough to keep hot-service items warm and edible.

A word of caution is evident here, however, as the laboratory director of a food packing company points out that studies show temperatures in vending machines in poorly ventilated areas may go as high as 200°F. This is well into the distortion range of the material.

The biggest potential seems to be in foods packaging—with limitations. Processed foods, chilled salads, some cheeses, desserts, puddings, etc., are candidates for packaging in oriented polystyrene. The only limitation mentioned to us is glazed donuts, which require a package which picks up moisture.

Aside from the perennial "how many foods do you want to see in the package, anyway?" query, the market is open—except to greasy products. Also small disposable drinking cups and disposable trays or baskets for foods (berries) are potential areas.

However, user consensus indicates that the material will not be used for inexpensive food products or toilet goods, nor for dry products needing good moisture protection, nor for products that are

not appealing in see-through containers.

FACES BRIGHT FUTURE

Suppliers and converters see a rosy, rapidly expanding future for oriented polystyrene. Suppliers state a "terrific potential," and at least one is building added production capacity to get into the heavy gauge market.

Converters point out that most of the prepared foods market will at least consider oriented polystyrene

Current Users

Companies currently using the material are more reserved; problems in handling containers, added costs, etc., dampen some of their enthusiasm, but they concede the the field is open and probably will expand.

Potential Users

Companies not now using the material but nonetheless potential users and having evaluated the material are still more reserved. General comments indicate that oriented polystyrene is "another plastic material fighting for its spot" in the array of packaging materials presently available for packagers.

Finally, a dissenting, disenchanted voice comes from a supplier company considering entering competition. It notes that unless there are major improvements in oriented polystyrene, it will be lucky to double its present volume in the next five years.

This company asserts that polypropylene will win the freeze-and-boil-in-the-bag packaging market and adds that you can steam sterilize polypropylene where you cannot polystyrene. It also notes that high-density polyethylene and polyvinyl chloride are challengers in this market.

With improvements, oriented polystyrene *films* may have a better potential than the sheet material, this company goes on, concluding that polypropylene may knock oriented polystyrene out of the market.

Another potential user not currently using the sheeting commented that prices on styrene resins have bottomed out; they will not get any cheaper in the foreseeable future (five to ten years). Low- and high-density polyethylene prices should drop below that of polystyrene on a yield basis, according to predictions, and should (within five years) cost less than general purpose styrenes.

Finding Its Place

In conclusion, it appears that oriented polystyrene will find its niche in selective areas of foods and novelty packaging. Its mechanical and handling limitations and further price cuts by other sheets (and improved plastics) may confine it within narrow bounds. Even so, it is destined to find its place substantial. However, it shares the risk common to all materials—something new may come along and replace it. *(End)*

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All sessions will be on Wednesday evenings from 7 to 9 p.m. Program details are as follows:

First session—October 25:
Will review the potentials of packaging for the 60's and look at some problems of packaging operations.

Second session—November 1:
Will review paper and paperboard, glass containers, and metal containers.

Third session—November 8:
To consider plastics (basic and converted materials) and aerosol and pressurized packages.

Fourth session—November 15:
Covers production line operation and packaging equipment; will review the selection of equipment and details of production line operations.

Fifth session—November 29:
Focuses on procurement and specifications; to look at package material purchasing for foods and for drugs, as well as shipping and handling.

Sixth session—December 6:
To review packaging regulations and the future of packaging.

Further information is available from Andrew J. Bartilucci, dean, college of pharmacy, Albertus Magnus Hall, St. John's University, Jamaica 32, N.Y., Telephone: JAmaica 6-3700, Ext. 277. *(End)*

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A new quart milk bottle blow molded from a combination of polyethylene resins is designed

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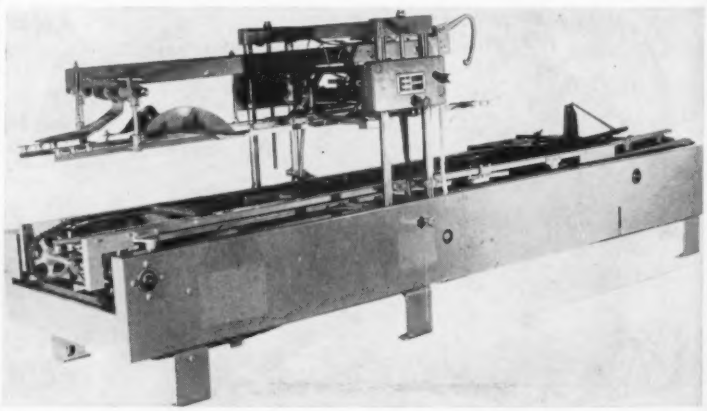
2—Unit applies glue in stripes, seals case flaps

Applying glue in uniform stripes instead of solid coatings, Emhart's new SK-455 case gluer holds down glue consumption and prevents spattering. There is a case-controlled skip-gap application pattern that prevents glue dropping through case slots onto contents. There are no glue pots and rollers because glue feeds from a reservoir under low pressure through hoses and applicators directly to case



flaps. When not actually functioning, applicators rest on moist pads to prevent glue from hardening on or inside them. Glue is exposed to air only at the moment of application. Once set, the width and length of glue patterns remain constant. Instead of shear pins there is electrical overload protection; simply pushing a button restarts the machine after an overload. When it stops, the applicator head moves away from any flap in gluing position and cuts off the flow of adhesive. Emhart says production line tests show that stripes set faster than coatings, and the sealing strength of stripes is equal to or higher than that of coatings.

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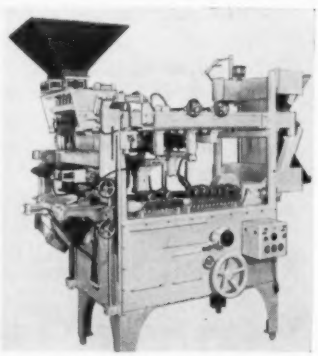
3—Bag cools, then fills

By forming and opening a complete bag at one station and filling the bag with product at a second station, the new Nash-Pak 500 gives the bag's seal welds time to cool before product goes in. This form-fill-seal machine packages solids, liquids, and powders. Having two stations permits handling a greater range of products than otherwise. Products vulnerable to heat can run on this unit because the sealing heat dissipates into the air and the seal welds cool before product goes in. The machine produces packages up to 8 in. long and 14 in. wide. It fills packages of different sizes as long as their lengths are identical. The machine combines

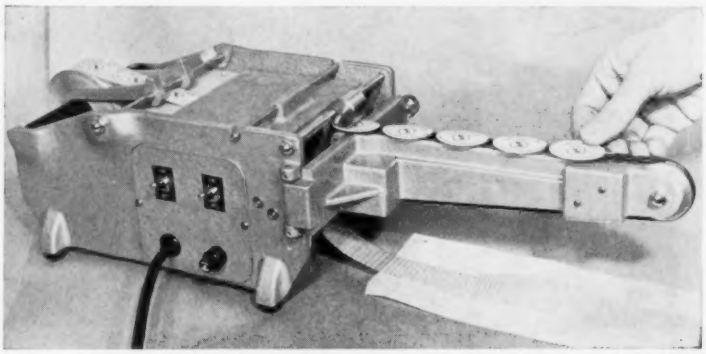


continuous and intermittent motion. Because there is continuous unwind of roll stock, film variation or stickiness does not affect operation. Intermittent motion permits stopping for fills—filling tubes move down into pouches thus cutting the product drop to about 4 to 6 in. and thereby minimizing dust. Idler rolls absorb the slack of the continuously moving film while the machine stops for fills. The machine uses either hot seal or impulse sealing. Making package size changes involves merely relieving and adjusting the settings.

Circle code number on card or write: J. M. Nash Co. Inc., Dept. PE, Oshkosh, Wis.

4—Automatic dispenser feeds labels from rolls

Merely removing the label from the new PS-100 pressure-sensitive roll label dispenser makes another label feed automatically into position. This machine feeds out a roll of pressure-sensitive labels, peels the labels from the backing strip, and uses a belt to deliver labels to an operator's fingertips. Two round rubber belts running side by side combine as a carrying belt. Top feeding speed is 20 ft./min. which suggests a feeding speed of 200/min. for 1-in. labels. This machine handles die-cut or butt-cut labels, takes a roll up to 6 in. wide and up to 6 in. diameter.



Since a contact switch controls label delivery to a fixed point, an operator does not need to reach for labels on the fly. Labels are accessible from either side or front of the machine thus permitting use of two or more operators.

Circle code number on card or write: The Lakso Co., Inc., Dept. PE, 47 Ashby State Rd., Fitchburg, Mass.

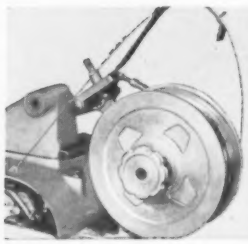
5—Pad in skid puts cushion outside of crate

Because it contains a cushioning pad of polystyrene foam, the new Pacco skid permits having cushioning outside rather than inside a crate, large box, or pallet. Skids come in 15 sizes and protect loads from 100 to 3,000 lb. Each skid has a 1½-in.-thick pad precompressed to 1¼ in. to minimize drift and thickness loss. Bolt nuts are frozen on with an epoxy resin compound. Steel brackets normally have a pickled and oiled coating but are also available cadmium-plated, hot-dip galvanized, or with a prime coating.

Circle code number on card or write: Packaging and Converting Co., Inc., Dept. PE, 4380 MacArthur Blvd. N.W., Washton 7, D.C. *(Turn page)*

50-LB. SPOOLS
with exclusive 3¾" metal core. Furnished in all sizes. 20 coils (1,000 lbs.) per easy-to-handle pallet pack.

Fast, Free-Flowing



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On exclusive 2½" paper coil with special heavy-duty cast aluminum spool holder; maintains absolute control at all times. Packed 4 spools per carton.

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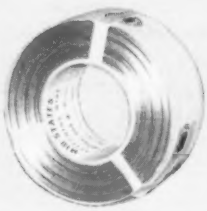
5 AND 10 POUND SPOOLS
Furnished on 2½" paper cores in all sizes. Packed ten 5-lb. spools (50 lbs.) and six 10-lb. spools (60 lbs.) per carton.



Stitching Wire

ROUND STEEL STRAPPING
Reduces pilferage and breakage because it effectively reinforces containers or bundles. Quick and efficient in application. In a wide variety of gauges, galvanized or coppered; in 5 to 500 lb. quantities.

...for Boxmakers and Shipping Containers

For dependable, trouble-free stapling of corrugated or fiber boxes and shipping containers, use free-flowing Mid-States Stitching Wire. Uniform temper drastically reduces wire breakage. There are no raw edges, no flaking . . . no clogging! Furnished flat and shaped in all standard sizes; galvanized or coppered. For further information, write or wire . . .

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MID-STATES STEEL & WIRE COMPANY
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6—Corrugated Tray Box

An integral raised handle running lengthwise down its center divides the new Piggy Pak

corrugated tray box into two sections holding four quarts of fruit each. This new container is easy to stack for storage shipment or display because its corrugated handle fits into a recess on the bottom of the tray box above it, locking both together. Designed to carry in one hand, the new box serves as picking basket, shipping container, and display tray.

Circle code number on card or write: Stone Container Corp., Dept. PE, 4200 W. 42nd Pl., Chicago 32, Ill.

7—Glue For Hot Cans

Developed for use with high temperature cans, Fuller's new lump-form pickup gum, PX-12, permits pickup labeling of hot cans right off a filling line. The pot temperature of this glue runs from 235° to 350°F. Principal features which its maker notes include lump form for easy handling, high tack for positive pickup, light color for transparency of film, ability to grab on all surfaces (metal, glass, or fibre) including greasy tinplate.

Circle code number on card or write: H. B. Fuller Co., Dept. PE, 255 Eagle St., St. Paul 2, Minn.

8—Can, Bottle Crusher

Made until recently for limited distribution, the Rescor can and

bottle crusher is now available on a production basis. The newest model, No. 2500, runs at 500

1-gal. cans/hr. or 1,000 5-gal. cans/hr. in contrast to 400-500 cans/hr. for earlier models. Designed to dispose of reject bottles or cans, this machine uses a motor-driven chain conveyor to move cans or bottles from the feed hopper to the discharge point. The machine action uses a scissors principle to flatten cans or break up glass bottles. The maker has available for metal can use a section which permits reclaiming nonfood products too costly to throw out, such as chemical specialties. Explosion-proof motors are available on this unit.

Circle code number on card or write: Rescor Industries, Dept. PE, Mt. Vernon, N.Y.

9—Strip Packager

Designed for quick changeover for size and shape of product, the new Uhlmann multiscope strip packager handles up to 6,000 units/hr., depending on product characteristics. It uses heat-sealable cellophane, thermoplastic-coated paper, and heat-seal coated or laminated aluminum foil. Choice of design permits feeding objects automatically by a vibrating feed or semiautomatically by using a rotating plate feed. Using sealing jaws, the new machine produces packages with a maximum width of 3 in. The maker points out that within minutes the machine can be changed over from packaging pressed tablets to packaging coated tablets, gelatin capsules, suppositories, or small ampuls.

Circle code number on card or

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Sure we said WIREBOUND . . . SUPERSTRONG WIREBOUND. The built-to-take-it shipping container that can't be beat for maximum protection, versatility, shock resistance. Downright dependable. Always on the go, with all kinds of products. Used everywhere. Just remember the name . . . Superstrong Wirebound—get the rest of its story now.

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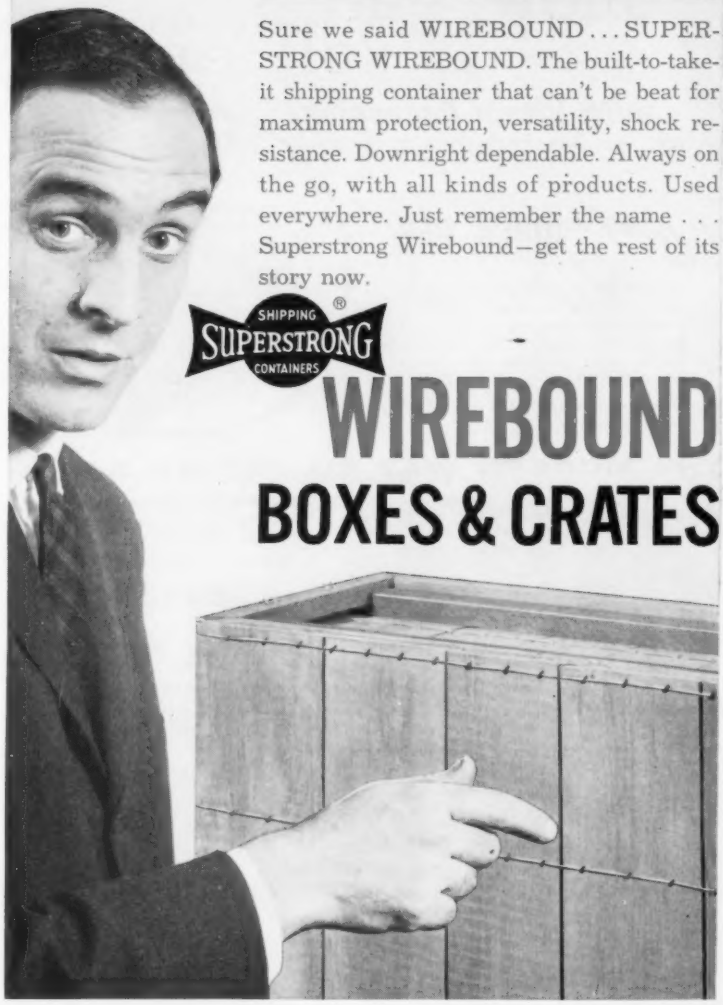
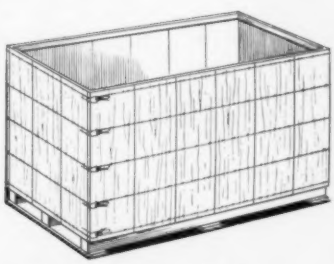


SUPERSTRONG WIREBOUND PALLET BOXES for economical, long-lasting, lightweight materials handling and storage.



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call CAnal 6-0973 or write Dept. 901

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Applications for various articles from 5/16" to 1¼" diameter for many industries.

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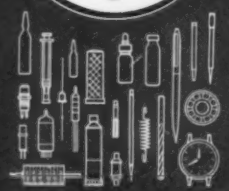
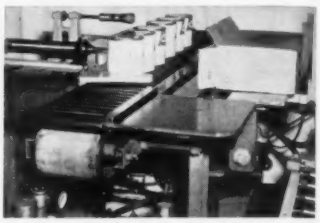


RONDO OF AMERICA, INC.
1002 SANFORD STREET, HAMDEN 14, CONN.

write: Chemical & Pharmaceutical Industry Co., Inc., Dept. PE, 90 W. Broadway, New York 7, N.Y.

10—Case Packer

Now available for side-loading cases, the latest Sheppard case packer accommodates cases to

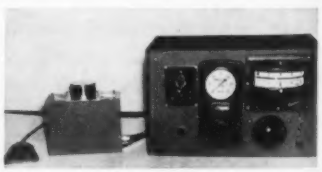


hold four 1-gal., two 1-gal., and six 1-qt. cans of products such as paint. In the 1-gal. size this machine loads two cans with each stroke of the air cylinder and in the 1-qt. size, three cans with each stroke. Operating speeds are now in excess of 30 gal./min. The machine orients each gallon can so that can ears go in case corners, then it pneumatically pushes in the cans, up ends the case, and discharges it to the case sealing operation. The machine is on casters and uses one operator who expands and positions case blanks.

Circle code number on card or write: Sheppard Machinery Inc., Dept. PE, 42 Jay St., Brooklyn 1, N.Y.

11—"Lab" Heat Sealer

Designed for use in packaging studies to determine best heat-sealing conditions (also useful



for quality control instrumentation) this new laboratory heat sealer was first developed in the Olin Mathieson research laboratories. It tests heat-seal characteristics of such films as cellophane and polyethylene under the conditions they normally en-

your GAYLORD man is a corrugated connoisseur

He has the knowledge and experience to give you sound advice about the type of corrugated or solid fibre board that bests suits your packaging situation.

He probably can suggest several ready-made answers to the container question foremost in your mind right now. After you make your choice, Gaylord tailors your box from a practically unlimited range of board.

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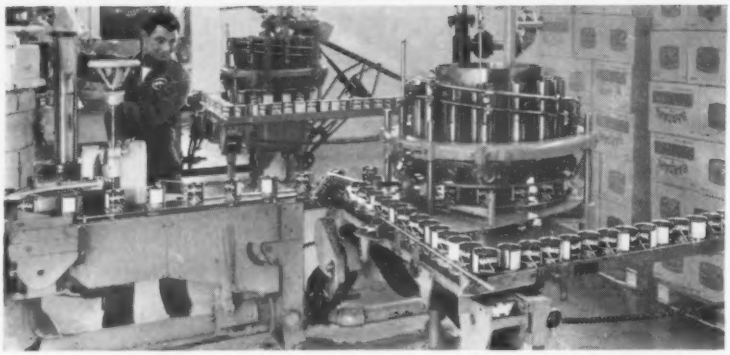
PLANTS COAST TO COAST

FLUIDICS* AT WORK

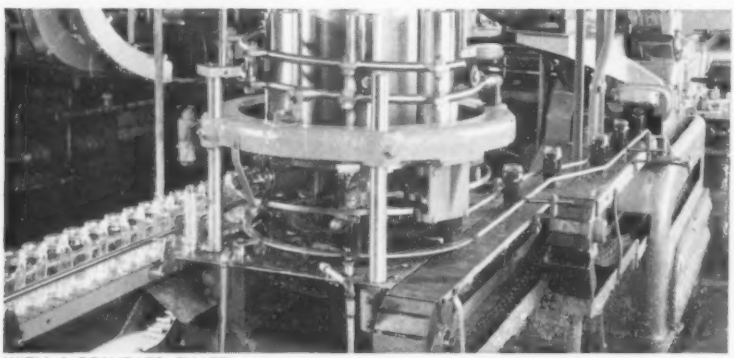


WITH A PFAUDLER FILLER:

NO MAINTENANCE or parts replacement in two years at Bardahl Lubricants Inc., where two Pfaudler® Rotary Piston Fillers handle a variety of viscosities and container sizes.

WITH A PFAUDLER FILLER:

CONTROLLED "HEAD SPACE" every fill is what Duffy-Mott gets while handling 190 quarts of applesauce every minute. Accuracy is held to ±1/10 fluid ounce.



WITH A PFAUDLER FILLER:

VISCOUS HOT FUDGE is filled with speed and accuracy at the Robert A. Johnston Company. Six- or eight-ounce jars are filled at the rate of about 55 a minute.

More information? Write to Pfaudler Division, Dept. PE-91, Rochester 3, N. Y. In Canada, contact Pfaudler Permutit Canada Ltd., Toronto.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

counter on high-speed packaging line machinery. Its manufacturer says it offers adjustable and closely controlled sealing temperature, pressure, and dwell time.

Circle code number on card or write: U.S. Testing Co., Inc., Dept. PE, 1415 Park Ave., Hoboken, N.J.

12—Bag Insert Sleeve

A polyethylene sleeve firmly fitted into the valve notch and extending inside each bag is now

available in a full line of sewn- and pasted-end multiwall shipping sacks. Upper left (see photo) shows construction, and lower right shows outside of valve notch with tape sewn in place. This sleeve is a free-ply within the bag and is not laminated to bag stock. The maker says the flexibility and self-cling characteristics of polyethylene contribute to tighter closing and improved bag performance in automatic packaging operations. Having a positive closure sleeve cuts the need for packaging in excess of designated weight to compensate for leakage in shipment, the maker notes.

Circle code number on card or write: Chase Bag Co., Dept. PE, 355 Lexington Ave., New York 16, N.Y.

13—Molded Containers

Available in 5- and 15-gal. sizes, Delaware's new single-trip polyethylene containers, the Featherweights, are of one-piece construction. They are available with steel or fibre overpacks, and

the question is time

During the past few years, the cancer cure rate has increased from one in four saved to one in three saved: 40,000 more lives saved each year. During the next few years, there will no doubt be new methods of diagnosis, and even cures for some cancers that are considered incurable today. In time, the ultimate goal, cancer prevention, will be achieved. But time alone will not do the job. ● Time plus research will. Research costs money. In the past 14 years, the American Cancer Society has spent about $76,500,000 on cancer research. Much more is needed to accomplish the final conquest of this dread disease. Give generously. Send your contribution to "Cancer," in care of your local post office.

AMERICAN CANCER SOCIETY

the answer is money

guard your family...fight cancer with a checkup and a check

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SYNTRON PARTS FEEDERS

—speed production, increase efficiency of most operations requiring continuous controlled feeding of small parts.

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—adaptable to most automatic machines. Supply parts in an oriented, single-line at rheostat controlled rates.

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Investigate the possibilities of Syntron Parts Feeders in your parts handling operation.

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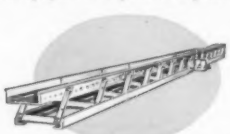

Mechanical Vibrating Conveyors

Hopper Level Switches

their closures include retractable pouring spouts, plugs, and caps. Delaware says the new containers in steel comply with ICC-37P specifications and in fibre comply with ICC-2U and ICC-21BP specifications. They are designed for domestic and export one-way shipments of hazardous and nonhazardous liquids, foods, pharmaceuticals, and other products.

Circle code number on card or write: Delaware Barrel & Drum Co., Inc., Dept. PE, Wilmington 99, Del.

14—Can, Bottle Coder

Designed to code the bottoms of large containers, the new Sideline Markocoder No. 3 at-

taches to a can or bottle conveying line. It operates automatically (by force of containers moving on the conveyor) at speeds up to 150 units/min. Developed to mark cans, canisters, bottles, and other cylindrical containers up to 10 in. high and up to 5 in. in diameter, the unit handles flush, recessed, flat, stacker, or concave bottom surfaces. There is a quick method of changing type. An inexperienced operator can attend the unit.

Circle code number on card or write: Adolph Gottscho, Inc., Dept. PE, 6 Evans Terminal, Hillside 5, N.J.

15—Cushioned Bag

Featuring heat-sealed side seams and a single flap closure, the new Zip-pak shipping bag is available in sizes from 5x8 to 15¾x20 in. The lining is of polyethylene. The bottom is folded to avoid chance of glue fail-

MUSHROOM PACKAGING

SHOWS—AND SELLS—PRODUCT FRESHNESS

What product requires more freshness protection—more *quick* appetizing recognition—than fresh mushrooms?

Dawn Fresh Mushrooms have scored a tremendous supermarket success. The fact that a superior product is rushed to market—fresh and delicious—is, of course, important. But packaging plays a key role, too.

The Dawn Fresh package shown is one of five pictorial packages made by KVP Sutherland depicting varied mushroom uses. Package design, furnished by the client, is reproduced in full-color lithography to stand out on vegetable counters. The tapered tray provides complete protection for mushrooms. Separate top is windowed to give excellent product visibility, locks into position to be tamper-proof. To assure maximum production speed, it is rapidly set up with the Kliklok Packaging Machine.

Here we have another example of KVP Sutherland's continuing work in the field of specialized packaging. Our package engineers are constantly called upon to perfect precisely the right packaging for a wide variety of products. Our complete engineering, design and printing facilities assure freshness protection and sales appeal, guarantee machinability for modern, high-speed production.

If *you* have a specific packaging problem, or an objective not currently being met, feel free to call on us. No obligation. Simply call or write.

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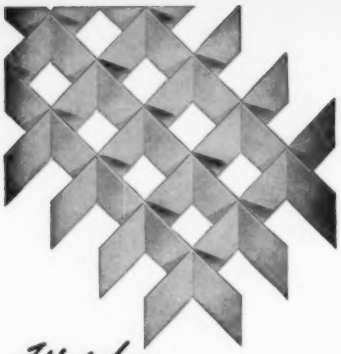
KVP SUTHERLAND PAPER COMPANY.....Kalamazoo, Michigan



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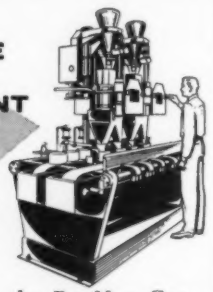


Illustrated is the Bar-Nun Can Line for feeding, filling, packing and ejecting cans, jars or cartons. Gump Equipment also includes net weighers for manual lines, and automatic bag packaging equipment. Packagers of dry powdered, granular or crystalline materials can stop costly overweights and save on packaging labor with the right model of this highly accurate and dependable equipment. Write for recommendations on your packaging requirements. Tell us the material, weight, container, capacity desired.

B. F. GUMP CO.

1346 S. Cicero Ave., Chicago 50, Ill.

ure, and there is a zip-type string opener.

Circle code number on card or write: Zip-Pack Inc., Dept. PE, 45 Hollywood Plaza, East Orange, N.J.

16—Bag Sealer

Ease of size changeover and simplicity of operation are among the features of the new

Pemcomatic Model 33 bag sealing machine. It handles widths from 4 to 12 in., lengths from 6 to 17 in., and heights from 1 to 8 in. Its speed ranges from 10 to 30 packages/min. An operator hand feeds each opened bag, fills it, then puts the bag and its product against a back guide rail. Fingers on the conveyor system then carry the package to the folding, tucking, and gluing stations, through a heated compression chamber and on to final delivery. Once the bag goes through the rear tucker, which is synchronized with the conveyor line, it passes through the folding plate, then into an enclosed gluing system. The adhesive container in the air chamber is sealed against air leakage. This machine handles paper, polyethylene, and other film bags as well as those of multiwall construction. Changes from one size to another can be done without shutdown except where package height is concerned. Even here two quarter-turn bolts speed the change of the tucker plate so that the machine gets back in operation within minutes. Changeover for package length involves simply adjusting the calibrated rear guide channel. A change of folding plates permits package height changes, and there are no adjustments for changing package width. The machine's casters give it portability, and these lock in place during operation.

Circle code number on card or write: Pemco, Inc., Dept. PE, Sheboygan, Wis.

17—Pie Filling Machine

Designed for mounting on bakery ovens, the new Colton-Hope pie filler No. 111 fills open-face pies with diameters between 8 to 12 in. Normal filler speed is 6 cycles/min., but it can run at 10 cycles/min. where an oven can bake pies that fast. There are from 8 to 12 nozzles for filling a row of pies simultaneously. Each nozzle has a piston cylinder and valve. Fill quantity is from 6 to 32 fl. oz. An adjustment device controls the piston stroke. The unit mounts on the apron of a tunnel-type oven and synchronizes with the oven pie feeder bar.

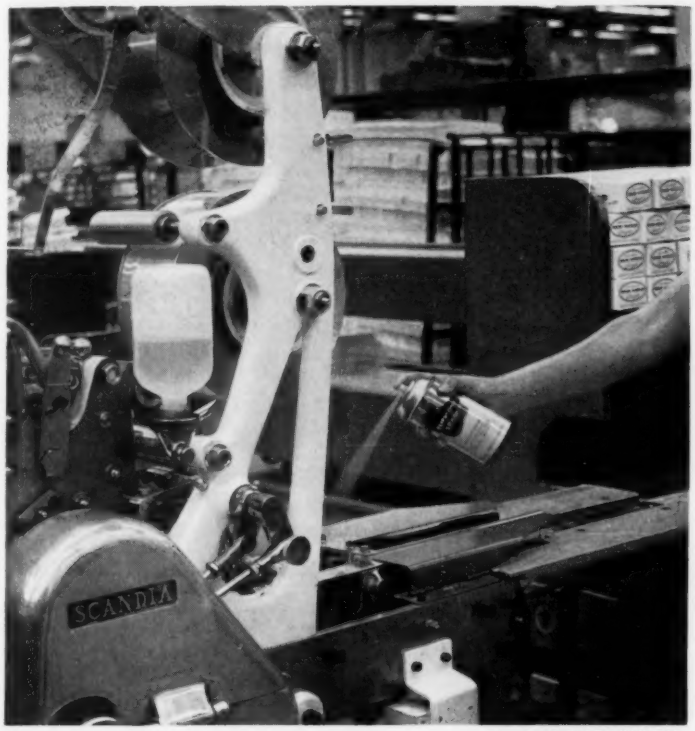
Circle code number on card or write: Arthur Colton Co., Dept. PE, 3400 E. Lafayette, Detroit 7, Mich.

18—Foam Strips

Continuous strips of polyurethane foam, known as Cipfoam tape, are now available in rolls.

These come in a full range of foam densities and compression ratios. This material provides the characteristics of polyurethane foam in tape form. Thicknesses range down to ⅛ in. and widths run from ¼ to 24 in. The maker notes that once a user pulls off the exact length of foam strip required for an application, the remainder stays on the roll without unraveling. This eliminates the problems of single-strip usage. *(Turn page)*

Sticking Gets The Slip



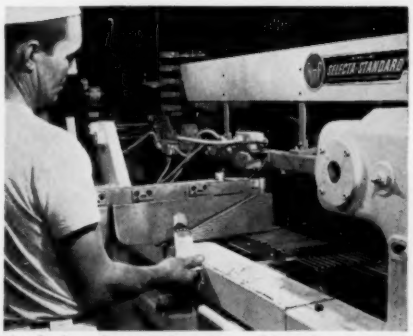
COURTESY P. LORILLARD CO.

SLIPICONE Prevents Jam-ups... Keeps Production At Full Clip!

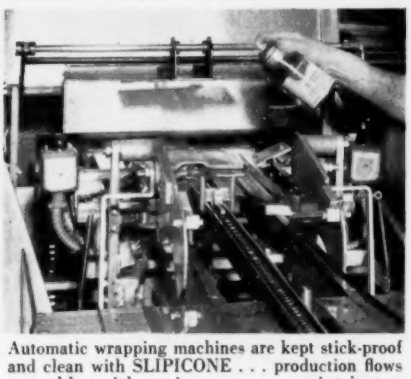
Got a sticking problem? Solve it with SLIPICONE®, the Dow Corning *silicone release agent*. SLIPICONE puts a slick, stick-free surface wherever you want one . . . prevents adhesives, packaging materials and products from sticking to (or piling up on) any surface. Thus, SLIPICONE speeds operations, reduces waste, keeps packages clean . . . *saves money!*

Safe—Heat Stable. Nontoxic SLIPICONE is safe to use in contact with fresh, frozen or baked foods*. Temperature extremes have little or no effect on SLIPICONE . . . it stays on the job — prevents sticking — from 40° below zero to 400° F.

Easy does it! A thin coating of SLIPICONE is all it takes. Simply spray or wipe it on any surface as needed. Get SLIPICONE from your paper wholesaler or packaging materials supplier.



Applied to heat sealing bars of bread wrapping machine, SLIPICONE increases heat-transmission and film-sealing speed . . . prevents sticking and tearing, browning and ink smear.



Automatic wrapping machines are kept stick-proof and clean with SLIPICONE . . . production flows smoothly, without jam-ups . . . maintenance is minimized.

SLIPICONE comes in 2 oz. tube, 8 oz. tube, and 12 oz. aerosol . . . to wipe or spray sticking problems away!

*Write Dow Corning, Dept. 9021, for complete data on use of Slipicone in the food processing industry.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

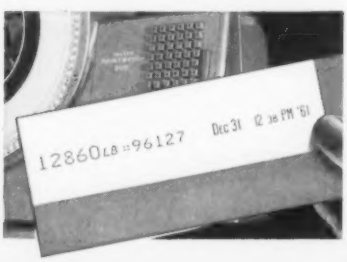
Why you should think of your scales as MONEY WEIGHING MACHINES

Cold, hard cash is the final value yardstick you must apply to every material or product that moves into, through, or out of your plant. How much does it cost? How much does it save? How much profit does it produce? In the last analysis, the answer always comes up in dollars and cents.

With dollars at stake, the *right* Toledo Scale at each weighing point is of the *utmost importance* . . . the backbone of control your needs demand. Your Toledo representative will take a personal interest in helping you get all the benefits provided by advanced Toledo methods and equipment. Write today. Toledo Scale, Division of Toledo Scale Corporation, Toledo 12, Ohio. *(Toledo Scale Company of Canada, Ltd., Windsor, Ontario.)*

TOLEDO PRINTWEIGH® "400"

provides complete printed weight records



Prints where you wish on full 8½" x 11" forms, or on tickets or strips. Prints full figures, even when unit weights are used. Positive weight identification, with selective numbering, weight symbols, or consecutive numbering. Also prints time and date, if required. Weight data may be transmitted electrically to remote adding or other office machines. Ask for Bulletin 2017.

SERVICE Factory-Trained 240 Cities

TOLEDO®

Headquarters for Weighing Systems

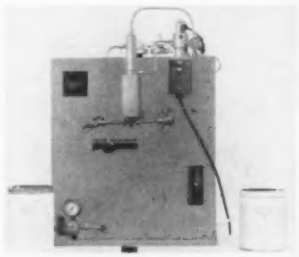
Circle code number on card or write: Carolina Industrial Plastics, Dept. PE, Mount Airy, N.C.

19—Poly-Coated Pouch

By adding extruded polyethylene to combinations of flexible materials, the new Maraflex 9-2 pouch provides resistance to abrasion. Because flexing and abrasion within shipping cases damage vacuum-packed or gas-flushed packages of cheese and other products, Marathon developed its Maraflex 9-2 with a high-resistance outer coating. Now making it in preformed pouches, the producer expects to offer the material in roll form. *Circle code number on card or write: Marathon, A Div. of American Can Co., Dept. PE, Menasha, Wis.*

20—Foam-In-Place Unit

Pak-N-Foam is a complete system (combining resin dispensers and other units not usually

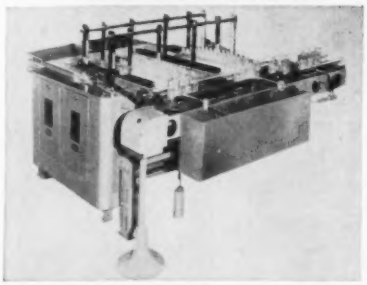


run in combination) that furnishes foamed-in-place packaging for appliances, machinery, or instruments, for example. The system's dispenser uses urethanes, polyesters, epoxies, silicones, and other resins.
Circle code number on card or write: Leal Corp., Dept. PE, P.O. Box 53, Oaklyn, N.J.

21—Strapping Tape

Designed for instant grab of corrugated boxes, the new Permacel 162 strapping tape uses a pressure-sensitive adhesive. This tape has a clear film backing and glass filament reinforcement which gives it a tensile strength of 325 lb./sq. in.

NEW! High Speed
WALKIE-PUSHIE
UNSCRAMBLER



• Designed to accommodate practically any size or shape container at speeds up to 400 to 450 per minute. Bottles, jars and other containers are unscrambled *without agitation* and transfer from chain to walking beam is very gentle, without any contact of containers. Invaluable in the distillery for odd shape flasks, in the drug and cosmetic industry for unusual after-shave and hand-lotion bottles, as well as other industries wherein not only round but also unusual shapes and sizes must be handled at high speeds. Write Dept. PE-9.

ISLAND EQUIPMENT CORP.
P.O. Box 380276, Miami 38, Fla.
Serving Industry 20th Year

Circle No. 278 on Card

If you ship 25 cartons a day...

You can enjoy the advantages of large-volume shippers

NOW — At a price well within the reach of the smaller shipper, the new BETTER PACK 555 ELECTRIC tape dispenser will give you the safest, strongest, fastest carton closures in America! GOOD CUSTOMER SERVICE starts with prompt, intact delivery of your product...and prompt, intact delivery starts with securely "laminated" closures. See for yourself!

Write name, company and address on margin and send to:

Better Packages, Inc.
Shelton, Conn.

Circle No. 279 on Card

Besides sealing and reinforcing boxes, the new tape is used for bundling, unitizing, and strapping.

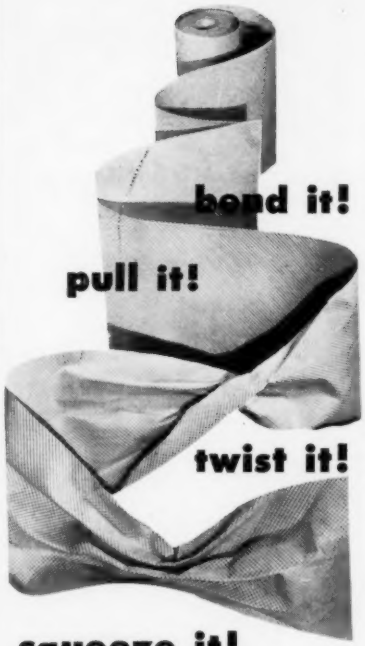
Circle code number on card or write: Permacel, Dept. PE, U.S. Highway No. 1, New Brunswick, N.J.

22—Precision Sorter

To handle a variety of object shapes without the limitations of earlier models, this new pre-

cision sorter has a hopper feeding directly onto the gauging rollers of the sorter. Earlier standard units have rollers which provide the agitation necessary to unscramble and feed parts but limit the action to relatively simple shaped objects. The new model has a vibratory type feeder which provides a steady stream of parts onto a receptacle above the rollers—which direct the parts for orienting and gauging. Gauging elements are two hard chromium-plated rollers inclined at an angle. They revolve so that adjacent sides move upward. Their action causes the items deposited between them (such as pharmaceutical tablets, capsules, beans, peas, candy, etc.) to move along the channel formed between the two rollers. This machine segregates items according to size or shape and has from one to ten outlets. The sorter gauges items at speeds up to 2,000/min. within ± 0.0003 in.

Circle code number on card or write: Count-O-Matic, Inc., Dept. PE, 40-24 22nd St., Long Island City 1, N.Y. (Turn page)



Shoksorb
PERMANENT CUSHION PAPER

Deep cushion-molds, formed at the wet end of the paper machine, are the **original** shape of Shoksorb molded indented packing papers. So even when you wrap, wad, or compress this springy, even-fibred, high-quality paper, it tends always to hold and to resume that original cushion-shape. Shoksorb protects your product all the way to destination. Use it for wrapping, lining, interleaving . . . replace bulk dunnage for smaller, safer, neater packages. Comes in several types, weights, any size or shape sheet, rolls. Ask for samples and picture-catalog.

KIEFFER PAPER MILLS
BROWNSTOWN, INDIANA

Circle No. 280 on Card

Volumatic PRESSURE FILLER

FOR VISCOUS PRODUCTS

Face Creams
Hair Dressings
Lotions
Lubricants
Paints
Wax Products

Cocktail Dips
Honey
Marshmallow Toppings
Mayonnaise
Mustard
Peanut Butter
Preserves
Salad Dressings

For continuous filling of viscous and semisolid products. Wide range of speeds up to 150 cpm. Handles all types of containers, including plastic, in small to large sizes. Ruggedly built throughout for hard service. Extra-heavy frame work, oversize motor. Available with combination pressure and vacuum filling. Will handle two dis-similar products simultaneously, such as salad dressing mixes. Infinitely adjustable for perfect service with your product. Variable speed, flow and fill line. Bottom-up filling eliminates air bubbles. Whatever your product, if you can pump it, you can fill it faster with the B-E Volumatic Pressure Filler.

OTHER "B-E" EQUIPMENT

Put your entire production line on a more efficient, money-saving basis with the B-E line of "Better Engineered" equipment, including "Filabelmatic," "Labelmatic," "Feedomatic" unscrambler and air cleaner, B-E Rotary Fillers, Accumulators, Corkers, Conveyors, Vacuum Units and a complete line of accessories.

BINER-ELLISON
MACHINERY COMPANY
1101 North Main Street • Los Angeles 12, California
Phone CApitol 5-8162

Circle No. 281 on Card

New L.A.B. RECORDING PACKAGE COMPRESSION TESTER

Handles greater volume of testing than previous models because platen remains fixed while pressure is applied by upward drive of base platform. Counterbalanced platen can be adjusted to desired height in seconds.

Pressures and deformation are automatically plotted on an electronic X-Y recorder (standard equipment) to provide a permanent record of each test.

Available in 2,000, 5,000 or 10,000 lb. compression ranges. Models for 48", 60" or 72" maximum height, all with 40" x 40" base platform and platen. Meets ASTM standards.

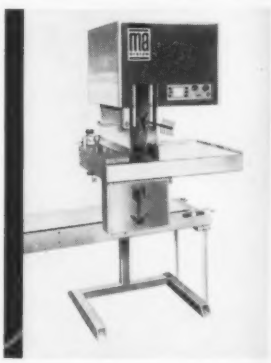
- **Compact, rugged, economical to buy, operate and maintain**
- **Built specifically for tests on shipping containers, packages and packaging materials**

WRITE FOR COMPLETE CATALOG SHEET

L.A.B. CORPORATION
Skaneateles 5, N.Y.

Circle No. 282 on Card

A new low-cost automated polyethylene packaging system



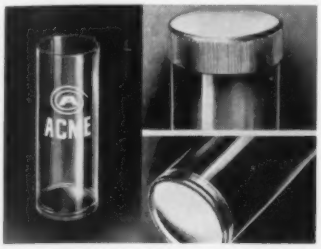
FUNCTION: Completely packages products in polyethylene film —in one operation—in your plant. Produces inexpensive loose or shrink-fit polyethylene packages around regular, odd-shaped or out-sized products of all types. **ADVANTAGES:** Uses polyethylene roll stock. Saves up to 50% on material costs over ready-made bags and other packaging methods and materials. • Boosts in-plant packaging efficiency, produces up to 30 packages per minute at reduced labor costs. • Provides a self-selling plain or printed package that protects, displays, reduces damage caused by excessive handling. • Simple to Operate—Easy to Maintain. **COST:** Complete MA Systems normally range from $2300 to $5000. **FREE OFFER:** Let the MA System test-package your product in durable, transparent polyethylene. Send us a sample, or write for complete details on this revolutionary packaging system to either: Mehl Manufacturing Company, 2057 Reading Road, Cincinnati 2, Ohio—or—Kordite Company, Macedon, New York.

ma SYSTEM

Circle No. 283 on Card

23—Acetate Containers

This new line of clear semirigid acetate containers features removable molded polypropylene



closures. They are available from ¼ to 1¼ in. in diameter and up to 7 in. in length. They have full-width straight openings and reinforced molded bottoms. Closures and bottoms are available in a range of colors, and the containers are extruded without seams.

Circle code number on card or write: Lermer Plastics, Inc., Dept. PE, 502 South Ave., Garwood, N.J.

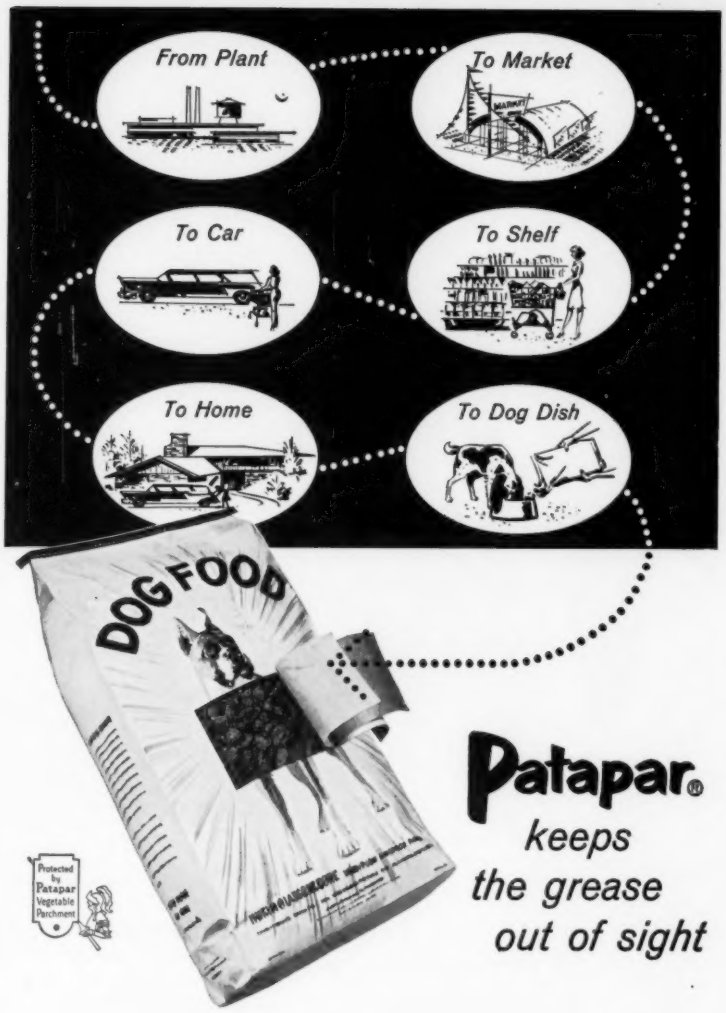
24—Case Handling Unit

The new Quadnumatic deluxe is a fully automatic case former, accumulator, packer, and sealer—all in one unit. It occupies less than 100 sq. ft. of floor space, has stainless steel construction, and uses a system of applying glue without rollers and pots. It features a pneumatic drive developed to eliminate moving parts.

Circle code number on card or write: Schroeder Machines Corp., Dept. PE, P.O. Box 1123, Syracuse 1, N.Y.

25—Polypropylene

Four new impact grades of polypropylene, with and without food grade additives, offer high flow and impact strength as well as resistance to low-temperature impact. Escon 205 has a melt index of 5.0 and a range of impact strength for most speciality applications. Escon 215 has the same properties but is formulated only with food grade additives. Escon 223



Patapar® *keeps the grease out of sight*

• During *l-o-n-g* storage, during *l-o-n-g* shipments, throughout *l-o-n-g* periods on a shelf—a dog food bag lined with Patapar keeps its fresh, clean appearance. This rugged Vegetable Parchment is grease- and abrasion-resistant, preventing staining and bursting. It's strong and absolutely pure. Patapar is usually used right next to the product so that the outer bag is fully protected from discoloration or staining from grease.

Send for free samples of Patapar Vegetable Parchment today.

PATERSON PARCHMENT PAPER COMPANY

Bristol, Pennsylvania

NEW YORK, N.Y. CHICAGO, ILL. SUNNYVALE, CALIF.

AN ASTOUNDING ADVANCE IN HOT MELT ADHESIVES!

The new "Series 29" Proxmelts seal and *stay sealed* to POLYMER COATED (K) CELLOPHANES, POLYETHYLENE, MYLAR, POLYSTYRENE, BUTYRATE, ACETATE, PLIOFILM, SARAN and other new "tricky" packaging films. The amazing versatility of these Proxmelt® adhesives also permits wonderful seals on all the old favorites . . . WAXED PAPER, GLASSINE, PARCHMENT, ALUMINUM FOIL, MST TYPE CELLOPHANES, etc.

OPERATION—FAST, SIMPLE, AND SMOOTH

"Series 29" Proxmelts assure really smooth performance throughout coating, printing, and converting operations. You can make your customers mighty happy with better heat sealing labels, bag strips, identification bands, bag headers, end seals, carton flaps, and other heat sealing components, when you use the highly versatile "Series 29" Proxmelts.

→ Free details are waiting for your letter or phone call.

Pyroxylin PRODUCTS, INC.

CHICAGO 32 Virginia 7-4800

PAOLI, PA. Niagara 4-4141

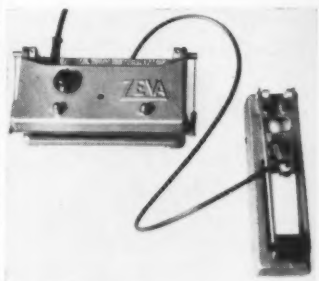
Mexico, D.F.

has a melt index of 1.0 and stresses resistance to low temperature impact. Escon 233 has the same properties but utilizes only food grade additives. Enjay says its two food grade polypropylenes are formulated with materials known to be nontoxic—either approved for food packaging uses or covered by extensions. Final FDA approval is pending, but the materials have approval from the U.S. Department of Agriculture for use in enclosing meat and meat food products bearing the marks of federal meat inspection.

Circle code number on card or write: Enjay Chemical Co., A Div. of Humble Oil & Refining Co., Dept. PE, Room 1131, 15 W. 51st St., New York 19, N.Y.

26—Bag Sealer

Designed for portability of operation (sealer and foot pedal weigh just 5½ lb.), the new



Packfix bag sealer is available in two models. One is for polyethylene and other nonsupported films. The other is for heat sealable laminates including paper, foil, cellophane, and similar combinations. The unit is thermostatically controlled and features cast-in heating elements.

Circle code number on card or write: Z Industries, Dept. PE, 1 W. 20th St., New York 10, N.Y.

27—Polyurethane

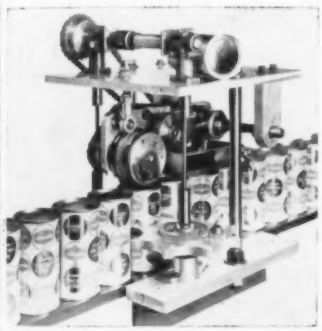
Offered as a dynamic cushioning material, the new Foam-Rap (using polyurethane) is available in three densities to meet MIL-C-7769 specifications

as follows: Type II (medium soft), Type III (medium), and Type IV (firm). It is available in 72-in. lengths which are 24, 36, or 48 in. wide. Thicknesses range from 1 to 4 in. without lamination. The manufacturer offers it either die-cut or in cut-to-size pieces.

Circle code number on card or write: Leewood Corp., Dept. PE, 900 Lawrence St., Lowell, Mass.

28—Can Imprinter

A new can imprinting unit is now available as an attachment to a packaging line. Its speed



range thus depends on the line speed, but the maker reports the unit can mark up to 1,000/min. It has a flexographic inking system and a floating printing head that follows can top contours. It also adapts to the printing of can bottoms. It has an inertia device to keep star wheels in proper position and prevent them from overrunning.

Circle code number on card or write: Industrial Marking Equipment Co. Inc., Dept. PE, 655 Berriman St., Brooklyn, N.Y.

29—Filler Clutch Unit

A clutch attachment is now available to adapt Filamatic portable fillers for automatic conveyor line operations. With this clutch (which the manufacturer puts on when the user returns the filler to the factory) the filler is actuated when containers on the conveyor depress a cable-connected Micro Switch. When the containers are lightweight plastic bottles, a photocell may take the place of the switch. Where the switch remains depressed during the fill cycle, there is a maintained contact type actuator. Where the switch is depressed momentarily and immediately released, there is a momentary contact type actuator. Either way the clutch facilitates an automatic in-line operation.

Circle code number on card or write: National Instrument Co., Inc., Dept. PE, 2701 Rockwood Ave., Baltimore 15, Md.

30—Bag Opening Tape

A triple-strength filter tape instead of a standard filter cord now provides a full-top or a

pour-spout opening for sewn open-mouth and sewn valve multiwall bags. This new closure, called Grip-N-Rip, is sewn right over the regular bag top tape and has a pull tab for opening. Pulling the filter tape also frees the regular bag top tape (the same thread holds both) and thus opens the bag. Pasting the regular bag top tape along the top except for a few inches at one end to provide limited opening makes a pouring spout. Once a user pulls the filter tape away this far, he folds back the unglued section of the regular tape, thus forming the spout. Folding the tape back over the spout and flipping it in place recloses the bag.

Circle code number on card or write: St. Regis Paper Co., Dept. PE, 150 E. 42nd St., New York 17, N.Y. *(End)*

Your
SOABAR MAN*
recommends...

"Here's a real time-and-money saving production tip: Mark tickets and labels in your own plant . . . when you want them . . . without costly inventories of pre-printed items. It's easy the SOABAR way! You see, SOABAR roll tickets and labels are designed to your exact marking specifications . . . tailored to your requirements for neat and accurate product identification, pricing, content disclosure, shipping or internal control. And versatile SOABAR marking equipment keeps pace with your production line . . . rapidly, efficiently, automatically. Ask your SOABAR MAN next time he calls how SOABAR marks everything but time."

* **Robert Tragus, District Manager, Cleveland, Ohio . . . one of 36 SOABAR marking specialists conveniently located throughout the U. S.**

Soabar COMPANY
Specialists in Marking Equipment and Roll Tickets and Labels Since 1912
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INDUSTRY LITERATURE available free

A SERVICE TO READERS: To get free copies of this literature follow instructions on Reader Service Cards inside front cover or write direct to manufacturer.

101—Label Imprinter

A catalog sheet outlines the operation and advantages of an imprinter capable of making 8,000 impressions/hr. Designed to print pressure-sensitive labels (from 7/16x1-9/16 in. to 4½x4-3/4 in.) from type, rubber plates, or slugs, the unit features automatic rewind and five-roller inking. Applicable for imprinting code numbers, dates, electrical data, prices, etc., the machine prints on foil, fabric, paper, and other types of stock. For a copy write: Avery Label Co., Dept. PE, Div. 179, 1616 S. California St., Monrovia, Calif., *or circle number on card.*

102—Tying Machines

How to operate Bunn machines, how to thread them with twine, and how to make various types of ties (one-way wraps; cross ties; single, double, or triple wraps) are some topics covered in an 18-page booklet on Bunn package tying machines. Other sections of this maintenance manual and parts catalog are: how to avoid problems; how to perform certain maintenance operations; how to obtain a perfect knot; and what to do when trouble develops. A complete parts list and exploded view drawings of the machines are also included. To receive this booklet write: B. H. Bunn Co., Dept. PE, 7605 Vincennes Ave., Chicago 20, Ill., *or circle number on card.*

103—Chemical Equipment

Four more bulletins are available for inclusion in Pfaudler's chemical binder: Bulletin 1010, Pfaudler Permutit buyer's guide (supersedes No. 992); Bulletin 1007, Pfaudlon 301 plastic coating; Bulletin 1001, TW drive agitation equipment (supersedes No. 951); Bulletin 1006, wiped film evaporator. A revised table of contents for the chemical binder is also included. To receive copies write: The Pfaudler Co., Div. of Pfaudler-Permutit, Inc., Dept. PE, 1000 West Ave., Rochester 3, N.Y., *or circle number on card.*

104—Extensible Paper

A 16-page pocket-size booklet tells what Clupak extensible paper is, how it is made, how it differs from conventional paper, and cites five of its advantages. Photographs show typical applications: grocery bags; multiwall bags; wrapping for lumber, automotive parts, etc. The booklet also covers extensible paper coated with polyethylene, asphalt or wax, impregnated with wet strength resins, and bleached or colored. For this information write: Clupak, Inc., Dept. PE, 530 Fifth Ave., New York 36, N.Y., *or circle number on card.*

105—Blister Sealer

A 4-page brochure illustrates and describes the Blist-O-Matic, a fully automatic blister packager-sealer which seals blisters to cards and ejects finished packages at a rate of 3,000-5,000 finished packages/hr. Range of card sizes handled and machine dimensions are also included. For this brochure write: Wirth-Rhodes, Inc., Dept. PE, 1914 W. 14th St., Chicago 8, Ill. *or circle number on card.*

106—Drum Gauging Chart

A 14x17-in. wall chart tells how much liquid is left in a partially used drum. The chart is designed for U.S.I.'s ethyl alcohol but can be used for any liquid with a similar coefficient of cubical expansion. Covering 55- and 30-gal. drums, stored in either vertical or horizontal position, the chart converts wet inches of stick measurement into gallons of liquid. It can be used for alcohol stored at temperatures from 30° to 90°F. To receive a chart write: U.S. Industrial Chemicals Co., Dept. PE, 99 Park Ave., New York 16, N.Y., *or circle number on card.*

107—Urethane Foams

A 12-page illustrated booklet gives applications and advantages of Nopcofoam pour-in-place urethanes. Nopco formulates the foam mix for each application and ships the ingredients with instructions for mixing. To receive this literature write: Nopco Chemical Co., Plastics Div., Dept. PE, 175 Schuyler Ave., North Arlington, N.J., *or circle number on card.*

108—Sandwiching Machine

A 4-page brochure describes the Model PT double-row cookie sandwiching machine. The brochure describes the operation from receiving the basecake from the oven to making the cookie sandwich. Also included are variations by which the machine delivers sandwiches (depending on the type of packaging), complete specifications, and eight different floor plans for bakery installations. For a copy write: Peters Machinery Co., Dept. PE, 4700 Ravenswood Ave., Chicago 40, Ill., *or circle number on card.*

109—Wrapping Machine

A data sheet and two illustrations are available for Oliver's semiautomatic wrapping machine Model 898. Roll-type continuous-web overwrapping films (cellophane, wax paper, heat-seal glassine, heat-seal foil) are used. The data sheet describes the operation and gives specifications. For this information write: Oliver Machinery Co., Packaging Div., Dept. PE, 1025 Chancy Ave., Grand Rapids 2, Mich., *or circle number on card.*

110—Polypropylene

A 12-page technical booklet gives information on Hercules' cast polypropylene film, Pro-fax. The four

Circle No. 287 on Card ▶

We'll send you one test roll of "V" cellophane, one 4¢ stamp, one sheet of paper, one self-addressed envelope and one pencil.

Run the cellophane off on your own equipment. Or on your converter's. If you don't find that it's the best cellophane ever made for premium baked foods, write us a nasty letter. (It won't even cost you a 4¢ stamp.)

We think you'll find that "V" prints, machines and seals with the bare minimum of production problems. That its shelf appearance has the magic for turning a stray glance into an impulse. And "V's" polymer coating—virtually unaffected by the heat and chemicals of printing—shuts in needed moisture, along with all the tang and savor you've put into your product. It's so good at this, in fact, that we actually believe you'll end up sending us a *complimentary* letter.

But don't do it just to be nice.

Test rolls supplied through any Olin sales representative or your converter in accordance with our usual policy.

PACKAGING DIVISION **Olin**

Film Operations, 460 Park Avenue, New York 22, N. Y.

main sections of the booklet are: applications, properties, processing, converting, and packaging. Technical data includes typical property ranges of Pro-fax; the processing section includes 40 charts. To get this literature write: Hercules Powder Co. Inc., Dept. PE, 910 Market St., Wilmington 99, Del., *or circle number on card.*

111—Net-Weight Scale

Model 3012 Speedweigh scale is described in a 4-page brochure. This 5-lb. capacity net-weight packing scale is designed for check-weighing, filling, issuing predetermined quantities, and count-by-weight operations. The literature shows the tower indicator positions available, the commodity equipment offered, and gives scale specifications. For a copy write: Toledo Scale, Div. of Toledo Scale Corp., Dept. PE, Toledo 12, Ohio., *or circle number on card.*

112—Cellophane Code

A price sheet incorporating the new code system for computing unit packaging costs for Avisco cellophane is available. Under the new system the three digit code numbers in front of the film's letter designation are directly related to yield—the number of square inches per pound expressed in hundreds. For this price list write: American Viscose Corp., Film Div., Dept. PE, 1617 Pennsylvania Blvd., Philadelphia 3, Pa., *or circle number on card.*

113—Parts Feeders

Typical installations and details of construction of Elk-O-Matic vibratory parts feeders are presented in a brochure. It also shows the five models manufactured, different features available to meet customer specifications, and gives a diagram of maximum dimensions and specifications for each unit. To get a copy write: Elk Engineering Works, Dept. PE, St. Marys, Pa., *or circle number on card.*

114—Die Cutting Press

A bulletin describes Comet's pneumatic die cutting press for trimming blister, skin packages, and other vacuum formed products. Features and specifications of the machine are included and extra equipment is listed. For this bulletin write: Comet Industries, Inc., Dept. PE, 9805 Franklin Ave., Franklin Park, Ill., *or circle number on card.*

115—Bag Selector Chart

To help in selecting the right size bag for produce, Dobeckmun offers a 14x18-in. chart covering more than 80 packaging situations. Twenty-one different stock polyethylene bags, their sizes and uses are listed. Where applicable, cellophane bags are also listed. For this chart write: The Dobeckmun Co., Div. of The Dow Chemical Co., Dept. PE, P.O. Box 6417, Cleveland 1, Ohio., *or circle number on card.*

116—Gummed Tape

A folder lists the advantages and features of Blue Ribbon gummed tape with Renacel-100 adhesive. Available in a range of colors, sizes, and basis weights, this tape can be printed in one to four colors for instructions, identification, etc. To receive a copy write: Hudson Pulp & Paper Corp., Dept. PE, 477 Madison Ave., New York 22, N.Y., *or circle number on card.*

117—Single-Face Corrugated

A folder on the uses of single-face corrugated for both internal and external protective packaging is being offered. Also included is a table of standard stock combinations and descriptions of printed, scored, waxed, and prefabricated varieties. For more information write: Sherman Paper Products Corp., Dept. PE, Newton Upper Falls 64, Mass., *or circle number on card.*

(Turn page)

CRACK OUT!
Many astute users of adhesives have cracked out of a cost-price-profit squeeze . . . with the help of FINDLEY adhesives.
Findley has been helping cost-conscious packagers and paper-converters hatch profits for many a year. Could help you, too.
Tell them your problem. They'll send samples.
You'll find what you save through using FINDLEYS won't be chicken feed.
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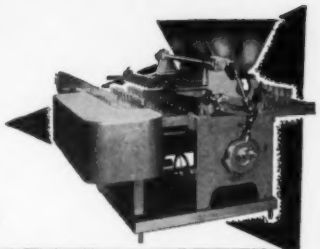

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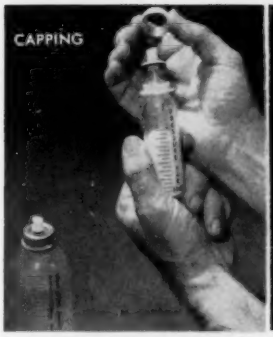

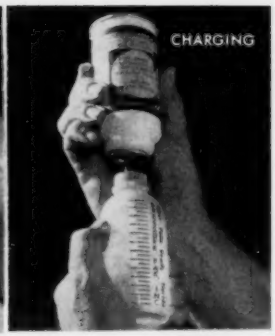

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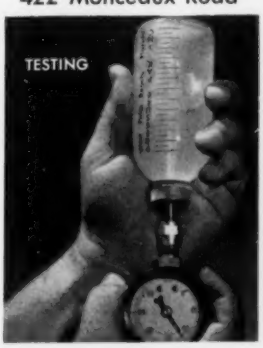

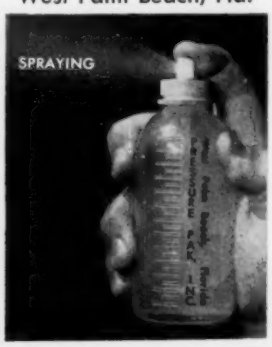

118—Molded Pulp Trays

"How you can take advantage of automated packing with Keyes molded pulp shapes" is a brochure containing information on prepackaging trays (including a 2-qt. produce tray in green), interior packaging trays for industrial application, and egg Filler-Flats. For this brochure write: Keyes Fibre Co., Dept. PE, Waterville, Me., *or circle number on card.*

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123—Packaging Abstracts

PACKAGE ENGINEERING magazine offers a data sheet describing *Packaging Abstracts*, a monthly publication which abstracts articles about packaging from some 200 magazines from all over the world. Each issue has 18 sections of topics pertaining to raw materials, adhesives, coating treatments, shipping containers, etc. For more information write: Package Engineering, Dept. PE, 185 N. Wabash Ave., Chicago 1, Ill., *or circle number on card.*

124—Anti-Slip Coatings

A 4-page illustrated brochure gives the advantages of Ludox anti-slip coatings and compares slippage of coated and uncoated cartons. For a copy write: E. I. du Pont de Nemours & Co. (Inc.), Industrial and Biochemicals Dept., Dept. PE, Wilmington 98, Del. *or circle number on card.*

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A brochure provides descriptions of the Spee Dee package filling machines. They are designed for dry products such as beans, noodles, nuts, sugar, candies, etc., with fill sizes from 2 gm. to 5 lb. To get this brochure write: Paul L. Karstrom Co., Dept. PE, 1822 W. 74th St., Chicago 36, Ill., or *circle number on card.*

126—Cushioning

An 8-page brochure (Form 650) shows typical applications and gives data on Tufflex cellulose fibre cushioning and fabric. For more information write: Wood Conversion Co., Dept. PE, 1st National Bank Bldg., St. Paul 4, Minn., or *circle number on card.* *(End)*

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A message to

Package research and development departments

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Technical and research libraries

Everyone concerned with what is being written in the world of packages

We recently were appointed American agents for *Packaging Abstracts*, published by the British research association PATRA—The Printing, Packaging & Allied Trades Research Association. This service gives you, in a single, handy periodical (published monthly, plus an annual index), brief summaries of packaging articles that have appeared in some 200 packaging magazines plus over 150 magazines devoted to printing and allied subjects, and numerous patents, books, pamphlets, and technical data provided by makers of machinery and materials.

This publication is unlike any other abstracting service in the world. It covers technical and operational packaging; it abstracts not only English language periodicals, but translates and abstracts foreign language publications from Germany, Russia, France, and every country in the world that publishes periodicals concerned in whole, or in part, with the various phases of packaging.

At present, each issue is divided into 18 main sections, including among others such subjects as packaging materials, adhesives, labels, coatings, and packaging machinery.

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The Cost Is Nominal

It costs thousands of dollars to collect, translate where necessary, evaluate, and abstract pertinent articles. Each month, literally thousands of pages of editorial material are read and the final result put into a handy 5½ x 8½-in. booklet averaging around 75 pages a month, plus the annual index. You can receive the 12 monthly issues plus the annual index for a total annual subscription price of only $42.00.

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What we think

Michigan State U's program needs unifying support

All reports indicate that top university officials and the trustees of its Packaging Foundation will pick a date in late 1961 or early 1962 to break ground for the school of packaging building. While cash pledges exceed $271,000, there is still plenty of room for contributions. The new building will cost over $400,000. Its planning allows future expansion as more money shows up after the first $400,000.

Initial plans called for $2,000,000 for a full scale school of packaging. Recognizing the need for packaging education now, the university is willing to reach this goal in stages. As soon as the rest of the first $400,000 comes in, construction can start.

After years of anticipation, the proponents of a well-equipped school of packaging are about to get one. But before they do, there is something more than money which the university needs. Without it the new building will be just so much metal, glass, and concrete.

This need is for understanding leadership and wise restraint. If the work of the school is to meet packaging field needs, its teachers and packaging people alike must be sure these needs are understood.

But once they are, the industry people should leave the rest to the good judgment of the faculty. At the same time, the professors should not try too hard to show their industry friends the fierce independence of academic freedom.

There is more *industry* participation in education than ever. There is more specialization in education too. This brings up another problem facing the budding school of packaging: where does it go on the university organization chart?

By circumstance it has grown up in the college of agriculture—the packaging work being an offspring of the department of forest products. Packaging never got into the college of engineering because of engineering's commitment away from "hardware" courses (such as packaging) and back to the basic sciences.

Some say the school of packaging needs a haven such as a college of *applied* engineering—where it and one or two other specialized programs might flower and develop under an enthusiastic dean willing to be more than a reluctant host to a burgeoning tenant.

Still another problem is the coordinating of MSU's expanding packaging research with the soon-to-be-enlarged school of packaging. MSU has generated a lot of support for its research project on the control of damage and is developing much interest in its two studies of permeability. How will all this fare in the new school of packaging?

The school also needs a broader base within the board of trustees of Packaging Foundation, Inc., the group formed to generate support for the school. The present trustees are able and alert. They have breadth of experience. However, the scope of the packaging field dictates still broader representation on the board. It should be more national and represent more companies that *use* packaging.

The foundation's energetic chairman, Orlin E. Johnson (he was once a school principal), Bristol-Myers' production vice president, and Henry G. (Harry) Walter, a retired U. S. Steel executive who has been spending the busiest days of his life as the foundation's executive director out beating the bushes to get support for the school, are looking for just such trustees.

While businessmen should stay out of purely academic problems, there are some academic decisions they ought to influence. For example, who should run the school of packaging? Maybe it should have the typical administrator. Or maybe some resourceful minds will find a way to let the top teachers do the directing without bogging them down in administrative routines. Instead of a chief executive officer perhaps there should be a sort of administrative assistant to do the paper work and hold the place together so that the top teachers need only apply over-all direction and so be free to concentrate on their teaching.

Thus run the problems the school faces. Until recently a lot of this was so much forward thinking. Now that the dream is about to become a reality let's make sure the reality gets the guidance it needs —as well as the hard cash it needs right now.

Bruce Hoffman

Editor

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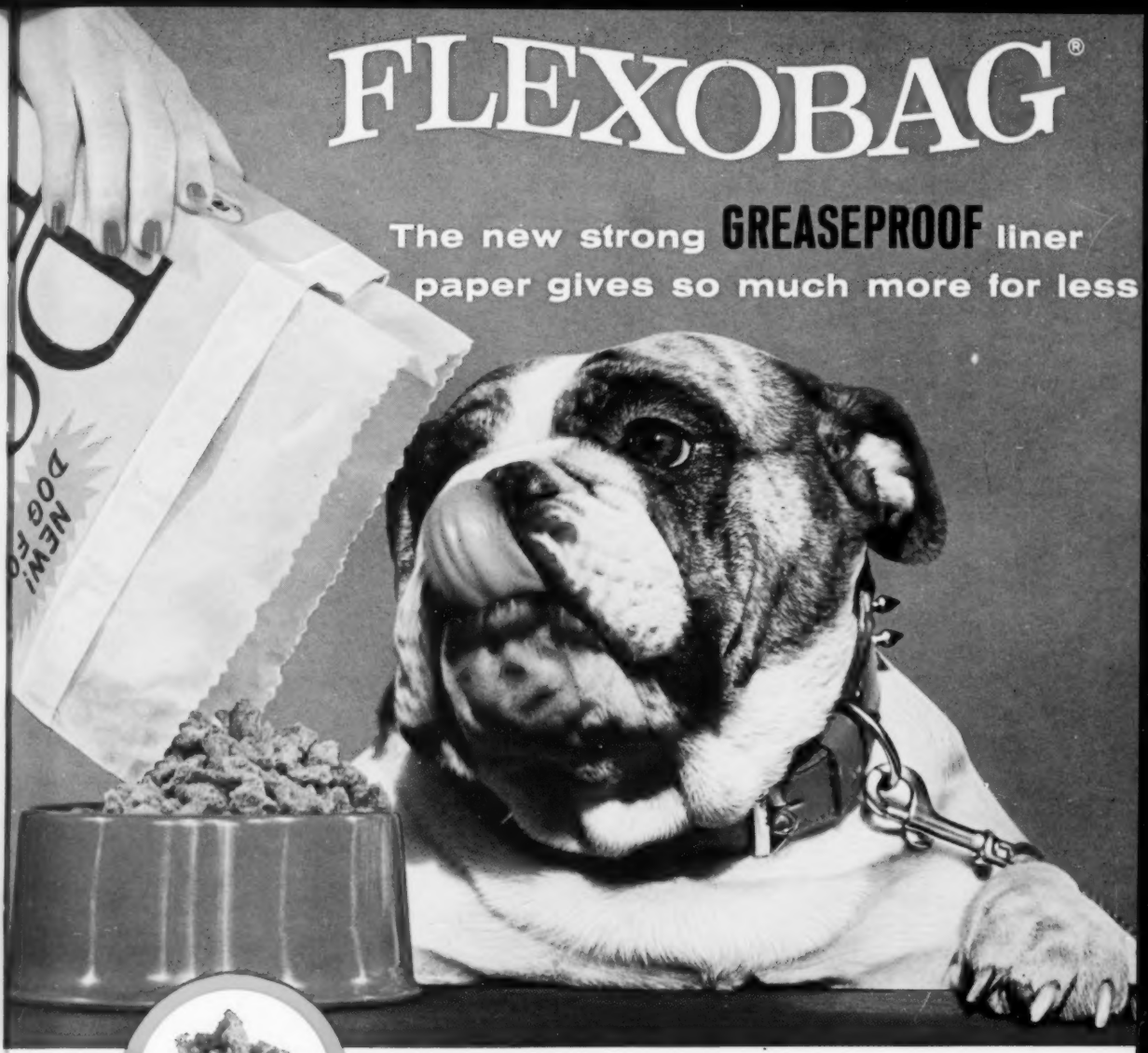

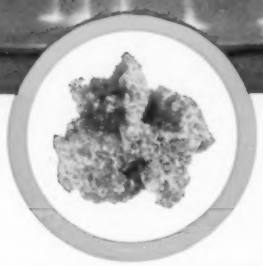

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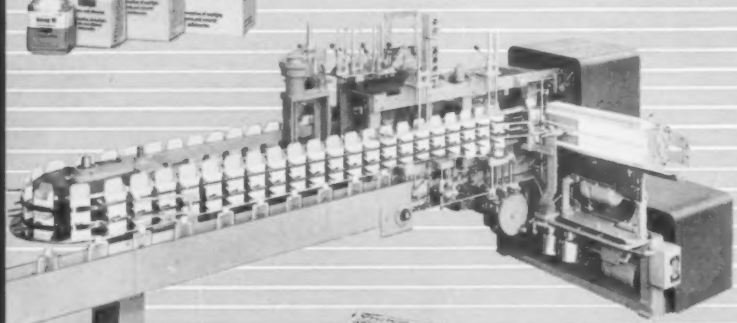

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